

**Original citation:**

Arikan, O., Gozluklu, Arie Eskenazi, Kim, Gi Hyun and Sakaguchi, H. (2018) Primacy in stock market participation: the effect of initial returns on market re-entry decisions. *European Journal of Finance*. doi:[10.1080/1351847X.2018.1459764](https://doi.org/10.1080/1351847X.2018.1459764) (In Press)

**Permanent WRAP URL:**

<http://wrap.warwick.ac.uk/100461>

**Copyright and reuse:**

The Warwick Research Archive Portal (WRAP) makes this work by researchers of the University of Warwick available open access under the following conditions. Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

**Publisher's statement:**

This is an Accepted Manuscript of an article published by Taylor & Francis in *European Journal of Finance* 10 April 2018, available online:  
<http://www.tandfonline.com/10.1080/1351847X.2018.1459764>.

**A note on versions:**

The version presented here may differ from the published version or, version of record, if you wish to cite this item you are advised to consult the publisher's version. Please see the 'permanent WRAP URL' above for details on accessing the published version and note that access may require a subscription.

For more information, please contact the WRAP Team at: [wrap@warwick.ac.uk](mailto:wrap@warwick.ac.uk)

# **Primacy in Stock Market Participation: The Effect of Initial Returns on Market Re-Entry Decisions**

Ozlem Arikan<sup>1</sup>

Arie E. Gozluklu<sup>2</sup>

Gi H. Kim<sup>3</sup>

Hiroaki Sakaguchi<sup>4</sup>

**This Version: March 2018**

*European Journal of Finance, Forthcoming*

## **Abstract**

We examine whether initial returns influence investors' decisions to return to the stock market following withdrawal. Using a survival analysis technique to estimate Finnish retail investors' likelihood of stock market re-entry reveals that investors who experience lower initial returns are less likely to return, even after controlling for returns in the last month and average monthly returns for the duration of investing. This primacy effect is robust to accounting for endogeneity in investors' exit decisions, and other behavioural biases such as recency and saliency of investment experience. Individual investors appear to be subject to primacy bias and tend to put a significant weight on initial experiences in re-entry decisions.

**Keywords:** Individual investor behaviour; Stock market participation; Experiential learning; Primacy effect; Stock market re-entry decision

**JEL Classifications:** G00, G02, G10, G11

<sup>1</sup> Aston Business School, Aston University, Birmingham B4 7ET, UK, e-mail: O.Arikan@aston.ac.uk; <sup>2</sup> Warwick Business School, University of Warwick, Coventry CV4 7AL, UK, e-mail: Arie.Gozluklu@wbs.ac.uk; <sup>3</sup> Corresponding Author, Warwick Business School, University of Warwick, Coventry CV4 7AL, UK, e-mail: Gi.Kim@wbs.ac.uk; <sup>4</sup> ESRC Network for Integrated Behavioural Science, University of Warwick, Coventry CV4 7AL, UK, e-mail: H.Sakaguchi@warwick.ac.uk.

The authors would like to thank M.J. van den Assem, Joseph Briggs, Ran Duchin, Douglas Foster, Samuel Hartzmark, Lena Jaroszek, Hyunseob Kim, Samuli Knüpfer, Jonathan Reuter, Tyler Shumway, Hannes Stieperaere, Yulia Veld-Merkoulova, and participants in the WBS Behavioural Science Group meeting, 2016 FMA Europe, 2016 FMA Asia-Pacific, 2016 World Finance Conference, 2016 AEFIN Finance Forum, 2017 Financial International Risks Forum, 2017 BFWG Conference, 2017 FMA Annual Meeting, and 2017 NFA Annual Meeting for their valuable comments and suggestions. Sakaguchi acknowledges a PhD studentship funding from ESRC with award reference 1499648. All remaining errors are ours.

# 1. Introduction

Individuals have become increasingly responsible for making their own financial decisions to smooth their consumption over their lifetimes. Direct investments in stock markets are an important vehicle for this purpose since they offer an equity premium especially in the longer term. Individuals' direct equity ownership is however decreasing over time while institutional investors' participation in the stock market is markedly increasing (Chordia, Roll, and Subrahmanyam, 2011). Extant literature examines the underlying reasons for this trend, suggesting that individual investors are particularly subject to noise trading which involves making unproductive investment decisions (De Bondt, 1998). Investment mistakes by individuals may lead them to either delegate the management of their finances to mutual funds (Gruber, 1996), or leave the stock market altogether (Stambaugh, 2014). The behavioural finance literature points to a number of psychological factors that may cause individuals to make irrational investment decisions.<sup>1</sup> It also suggests that these psychological biases are persistent and not easily eliminated by investors' learning and experience (Baltussen, 2009). In this paper, we contribute to this literature by focusing on yet another psychological factor, namely *primacy bias* (Asch, 1946; Nisbett and Ross, 1980), i.e., the dominance of the influence of initial experiences in final decision-making, and examining whether individual investors are subject to the primacy bias in the setting of their re-entry to the stock market following market exit.

Our setting of an individual investor's re-entry decision would be a good laboratory to study the primacy bias because re-entry decisions may be affected differentially by a series of multiple investment experiences during the investor's previous participation in the stock market.

---

<sup>1</sup> Such behavioural biases include, among others, availability bias (Shefrin, 2002), salience biases (Barber and Odean, 2006), familiarity bias (Frieder and Subrahmanyam, 2005), loss aversion (Barberis and Huang, 2001), and disposition effect (Odean, 1998).

The theory of experiential learning (Luce, 1959; Denrell, 2007) posits that individuals' choice of an uncertain alternative is influenced by their own experience of having chosen it in the past, and the likelihood of choosing it depends on the belief about the payoffs they will reap from their choice. Such belief is formed based on a sequence of multiple experiences with different payoffs, and individuals may not consider all experiences equally, and hence weigh a certain experience heavier than others. The so-called *primacy effect* (Asch, 1946; Nisbett and Ross, 1980) emphasises the salience of initial experiences, and posits that individuals may weigh initial observations more heavily than subsequent ones due to a cognitive bias, so their initial experiences dominate in their final decision making. The primacy bias is in contrast with the recency bias where individuals' latest experiences dominate their decisions (Furnham, 1986). Also, it is distinct from the salience bias (Bordalo, Gennaioli and Shleifer, 2012) where decision makers overweigh more salient payoffs, which are defined as the payoffs that draw their attention, such as very high or very low payoffs compared to the average.

Previous financial studies have documented various behavioural biases of individual investors based on their trading patterns. Regarding the information processing-related biases in particular, the recency effect is verified in a laboratory setting of auction markets (Tuttle, Collier and Burton, 1997), and the salience effect is documented in Barber and Odean (2006) and Hartzmark (2015), both of which show that individuals tend to trade the attention-grabbing stocks, such as high volatility ones, and best- or worst performed stocks in their portfolio. As for the primacy effect, Kaustia and Knüpfer (2008) investigate investor behaviour of subscribing to an IPO, and Carney and Banaji (2012) document it for the consumer behaviour in a laboratory setting. We contribute to this literature by showing the primacy effect in the entry and exit decisions of retail investors investing in the stock market. We provide evidence that the primacy effect

documented in our study prevails when we control for the most recent information. Furthermore, our results are robust to the salience of the initial experiences (the extent to which they are different than other experiences). We also provide evidence that the primacy effect we document is the violation of rational behaviour rather than rational learning about skill.

Based on the theory of experience sampling and the primacy effect, we hypothesize that investment returns in the first month of investing – referred to as *initial returns* – will have a significant influence on the likelihood of re-entry, even after controlling for average returns in all months of investing during the entire period of market participation (*all returns*). We test our prediction by applying a survival analysis technique to the transaction data of individual investors, covering every transaction by every investor in Finland from 1995 to 2003. Our final sample consists of 276,470 investor months, with 9,435 investors who once exited the stock market. As we are interested in the *time* that elapses until an investor re-enters the stock market, we employ a discrete-time (or monthly) hazard model as our main analysis method. We estimate this using a multi-period logit regression with both time-varying and time-invariant covariates, as well as various fixed effects.<sup>2</sup> Essentially, the variables we use to measure investors' experience of stock investment, including our main variable, *initial returns*, serve as time-invariant covariates in our regression.

Our main empirical finding is that initial returns strongly influence investors' decisions to return to the market after withdrawing from it. More specifically, investors who experience lower returns in the first month of investing and subsequently exit the market are less likely to re-enter than those who receive higher initial returns and also exit the market. The positive relation between

---

<sup>2</sup> The survival analysis technique has been widely used in the finance literature to study investors' decisions to sell or repurchase securities (e.g., Strahilevitz, Odean, and Barber, 2011; Seru, Shumway, and Stoffman, 2010; Kaustia and Knüpfer, 2008).

initial returns and the hazard probability of re-entry remains very strong, even after controlling for *recent returns* (i.e., returns in the last month of investing) and *all returns* (i.e., average returns in all months of investing). We also examine whether initial returns affect investors' re-entry decisions asymmetrically; that is, whether the likelihood of re-entry is more sensitive to initial returns when the returns are positive (gains) than when they are negative (losses), or vice versa. Our regression results show that the slopes (sensitivity) of re-entry odds as a function of initial returns are not the same, and are steeper when the returns are positive. This asymmetric pattern of investors' responses to initial returns with respect to re-entry decisions is in line with the prediction of the *self-attribution* or *self-serving* model (Daniel, Hirshleifer, and Subrahmanaym, 1998; Gervais and Odean, 2001). This theory posits that, in recalling and interpreting the factors involved in their successes and failures, individuals tend to attribute successes to their own skill but ascribe failures to bad luck. Consequently, positive initial returns may enhance investors' perceptions of their own skill, making them respond more sensitively to returns.

A potential concern here may pertain to our selection of investors into the final sample. Our sample comprises investors who once exited the stock market as they are investors we can observe a re-entry for. Since the investor's decision to exit is not randomly assigned, the estimation of re-entry probability based on this subpopulation of investors may introduce a bias. To alleviate this concern, we employ Heckman's (1976) two-stage model to control for endogeneity in investors' exit decisions.<sup>3</sup> Not only exit decisions but also initial entry decisions could be endogenous as they may be related to individuals' risk preferences, investing style (e.g.,

---

<sup>3</sup> More specifically, we first estimate the hazard probability of exit using the whole population of retail investors in Finland. Our sample for this analysis comprises about 3.5 million investor months with one million investors. We then include the estimated probability of exit (in the form of inverse Mill's ratio) as an additional control variable in our main regression for the hazard probability of re-entry.

momentum/contrarian-, or value/growth investing), or the macroeconomic environment (see, e.g. works cited in Campbell, 2006; Badarınza, Campbell and Ramadorai, 2016). To deal with this issue, we try to control for the initial stock's characteristics (such as idiosyncratic volatility/skewness, past performance, and book-to-market ratio), which should reflect investors' risk preferences and style investing to a certain extent. We also control for the stock market returns around initial entry to account for the effect of macroeconomic conditions. Our main results of the initial return – re-entry relation are robust to these treatments designed to account for the potential sample selection issue.

We provide discussion about some alternative explanations for our findings. The first is the confounding effect of investor wealth. After a large initial loss, investors may not be able to afford to return to the market, even if they wish to invest in it. In addition to using a statistical technique to deal with this concern (i.e., fixed effects such as investment size and zip code), our results are unlikely to be dominated by wealth effects because we control for returns over the entire period of investing in the stock market. The second is the possibility that our results stem from rational learning about skill rather than behavioural bias. In other words, large initial returns may enable investors to learn about their inherent investing skills/abilities; therefore, able investors have more incentives to return to the stock market.<sup>4</sup> As we control for average monthly returns during the entire holding period, our results cannot be explained simply by rational learning about skill. Furthermore, it makes little sense that investors learn about their skills during the first month of investing, especially given that the holding periods are much longer in our sample (mean = 11 months, median = 8 months). Lastly, while our study analyses the exit and re-entry decisions of investors who invest directly in the market, our exiting investors may have switched from

---

<sup>4</sup> One should however keep in mind that high initial returns may only be due to pure luck or good market conditions.

individual securities to diversified funds. However, mutual fund investments were very small in Finland until 2003 (see e.g., Kaustia and Knüpfer, 2012), which coincides with the end of our sample period. Furthermore, examining direct stock investments is important, as research suggests several problems with mutual funds that may prevent investors from reaping the premiums offered by equity markets (see e.g., Malkiel, 2013).

Our study may have policy implications regarding households' participation in the stock market. First, we show that investors' exit and re-entry decisions are affected by a behavioural bias, namely the primacy effect. Our results also imply that individual investors may initiate their investing very naïvely for a try-out, possibly on a "suck-it-and-see" principle (e.g., many of them only buy one stock and never trade before exiting), and show a "once-burnt-twice-shy" tendency to withdraw altogether from the stock market and forgo equity premiums after an unsuccessful try-out. Therefore, the market participation of these investors might be boosted by financial literacy programmes enabling them to make more informed decisions.

This paper belongs to the literature on individual investor behaviour. For example, Strahilevitz, Odean, and Barber (2011) document investors' reluctance to repurchase stocks previously sold at a loss. Seru, Shumway, and Stoffman (2010) find that past negative experiences of trading on the stock market induce investors to cease trading. Similarly, Linnainmaa (2011) concludes that investor's trade to learn about their abilities and a learning-based model can generate similar trading patterns. Malmendier and Nagel (2011) show that individual experiences of macroeconomic shocks relating to the stock market affect stock market participation. In a savings context, Choi, Laibson, Madrian, and Metrick (2009) show that individual investors over-extrapolate from their personal return experiences. Kaustia and Knüpfer (2008) show that personal experiences of IPO returns are an important determinant of future IPO subscriptions. Exploiting



randomized stocks in Indian IPO lotteries, Anagol, Balasubramaniam, and Ramadorai (2015) document that investors experiencing exogenous gains in IPO stocks tend to increase trading in their portfolios, and tilt their portfolios towards the sector of the IPO. Campbell, Ramadorai, and Ranish (2014) show that both years of investment experience and investment returns significantly affect the investment behaviour of inexperienced Indian retail equity investors. Our paper is different from the previous studies in that we focus on the behaviour of exiting and (re-)entering the stock market as a whole which is an important decision distinct from selling or purchasing individual securities (e.g., Strahilevitz, Odean, and Barber, 2011), or ceasing or continuing to trade securities while staying in the market (e.g., Seru, Shumway, and Stoffman, 2010; Linnainmaa, 2011).

The remainder of this paper proceeds as follows. Section 2 surveys the literature on the primacy effect, and Section 3 explains the model of experience sampling for stock market re-entry to develop testable hypotheses. In Section 4, we describe the data, sample construction, and our main variables. Section 5 presents the main empirical results, and Section 6 presents the results of Heckman's (1976) two-stage model to deal with the selection issue. Section 7 discusses some alternative explanations for our findings, and Section 8 draws conclusions.

## **2. Related literature: Primacy, recency, and salience effects**

Decision-making models supported by experimental evidence propose that information presented early on and initial experiences with the decision task have a dominant influence on final judgments. This is often referred to as the *primacy effect* (Asch, 1946; Jones, Rock, Shaver, Goethals, and Ward, 1968; Hogarth and Einhorn, 1992; Nisbett and Ross, 1980). For example, Nisbett and Ross (1980) argue that people are “theorists” in their approach to information on the social and physical world; information presented early on serves as raw material for inferences

and biases in interpretations of later information. Literature on the primacy effect in extensive series tasks highlights that participants' attention, and thus sensitivity, to later information decays over time, causing them to rely more heavily on initial information in their final judgments (e.g., Pinsky, 2011). In a self-evaluation context, Feldman and Bernstein (1978) argue that primacy effects can be predicted only for abilities in which individuals have no prior experience or knowledge regarding their own performance. In such instances, the individuals have not established a referent, and their self-attributions of ability are likely to be based on their initial performance.

Models of judgment and decision making also suggest that information presented later on may have a significant effect on final judgments. This is referred to as the *recency effect*, and is especially true when special memory constraints favour the recall of information presented later on, when circumstances produce strong contrast effects, or when faced with an object or process that can be presumed to be capable of changing over time (Ashton and Ashton, 1988; Tuttle, Collier, and Burton, 1997). Hogarth and Einhorn (1992) propose a belief adjustment model to explain the order effect on judgments. They propose that individuals build initial anchors after reading a first piece of information, and that these anchors are continuously updated based on subsequent information. The authors suggest that, when people change their beliefs after integrating each piece of evidence in a given sequence, the recency effect dominates when the number of pieces to be evaluated is low; otherwise, the primacy effect tends to dominate. On the other hand, when people change their beliefs only at the end of the sequence, the primacy effect dominates unless the amount of information presented is large and highly complex. Hence, it is open to question whether or not primacy bias has a first-order effect in all financial decision-making settings and, in particular, in the context of stock market participation.

Another related phenomenon which may influence investors' judgments in a series of observations is the salience effect which is studied in Bordalo, Gennaioli and Shleifer (2012). They posit that the extent to which decision weights are distorted depends on the salience of the associated payoffs, and not on the underlying probabilities. A payoff is salient if it is very different in percentage terms from the other payoffs. According to this theory, we should expect a return which is very different than the other returns to have a dominant effect on investors' decision in stock market participation.

### 3. Hypothesis development

Based on the theory of experience sampling (Denrell, 2007; Luce, 1959), we model individual investors' decisions to re-enter the stock market as a choice problem between two alternatives, i.e., investing in alternative assets such as bank savings vs. (re-)entering the stock market to invest. For the purpose of illustration, we assume that our investors are risk neutral,<sup>5</sup> and investment returns are scaled to be zero for the first alternative, and for the second alternative they are denoted by  $r$  that is a normally distributed random variable.<sup>6</sup> The investor does not know the population parameter,  $r$  but only infers it by choosing to sample its data through experience of participating in the stock market. Following the literature, we assume that the investor decides to return to the stock market if the estimated value for  $r$  is positive (i.e., greater than the payoff from the other alternative), but sometimes explores it even if it is negative. Specifically, the probability

---

<sup>5</sup> For simplicity, we assume risk-neutrality for investors in order to avoid the treatment of standard deviations of random returns. Our main implication of the model would carry through to the extended case with risk-averse investors at the cost of easy tractability of the model.

<sup>6</sup> As investment returns are assumed to be zero for the first alternative,  $r$  is understood to denote the return for the second alternative in excess of the return for its first counterpart.

of re-entering the stock market,  $P$  is assumed to follow the exponential version of the Luce choice rule (Luce, 1959):<sup>7</sup>

$$P = \frac{1}{(1+e^{-S\hat{r}})}, \quad S \geq 0, \quad (1)$$

where  $\hat{r}$  denotes the estimated value of  $r$ , and the parameter  $S$  measures the sensitivity of the probability of re-entry to the estimated payoff. If  $S$  is infinitely large, investors only choose to enter the market if  $\hat{r}$  is positive; otherwise, they may enter if it is negative.<sup>8</sup> When  $S$  is equal to zero, the decision is exogenous and independent of experience.

Investors infer the estimated payoff,  $\hat{r}$  after experiencing a series of past return observations ( $r_i, i = 1 \dots n$ ) as the weighted average of initial returns and subsequent returns:

$$\begin{aligned} \hat{r} &= w_1 r_1 + (1 - w_1) \sum_{k=2}^n \frac{r_k}{(n-1)} \\ &= \frac{(nw_1-1)}{(n-1)} r_1 + \frac{n(1-w_1)}{(n-1)} E[r_i], \quad n \geq 2 \end{aligned} \quad (2)$$

where  $w_1$  is the weight of the initial return ( $0 \leq w_1 \leq 1$ ) and  $E[r_i]$  is the average of all of  $n$  subsequent returns ( $\sum_{k=1}^n r_k$ ).<sup>9</sup> The primacy effect is reflected in these weights where the first return is weighed more highly than subsequent ones (i.e.,  $w_1 > \frac{1-w_1}{n-1}$ , or equivalently,  $w_1 > \frac{1}{n}$ ), *regardless* of the extent to which it is salient, or grabs investor attention (the salience effect). In contrast, the recency effect assumes a greater weight on more recent returns (i.e.,  $w_1 < \frac{1-w_1}{n-1}$ , or equivalently,  $w_1 < \frac{1}{n}$ ).

---

<sup>7</sup> This logit choice model has been shown in the psychology literature to have a good fit with individuals' repeated choice data (e.g., Busemeyer and Stout, 2002; Yechiam and Busemeyer, 2005).

<sup>8</sup> An investor's decision to enter the stock market after estimating a negative  $\hat{r}$ -value may be motivated by an individual's preferences for lottery-type investing, which could make up for her previous losses (see, e.g., Kumar, 2009).

<sup>9</sup> Without loss of generality, we assume that investors place equal weight on each of  $(n-1)$  subsequent returns,  $r_2, \dots, r_n$ , in order to simplify the problem to the case with two returns.

Re-arranging Equations (1) and (2), we obtain the following choice rule for investors' re-entry decisions:

$$\text{Log} \left( \frac{P}{1-P} \right) = S[A \times r_1 + B \times E[r_i]],$$

$$\text{where } A = \frac{(nw_1-1)}{(n-1)}, \text{ and } B = \frac{n(1-w_1)}{(n-1)} \quad (3)$$

Equation (3) shows that the logarithm of odds of re-entry is a function of initial returns ( $r_1$ ) and the average of all past returns ( $E[r_i]$ ). If investors are subject to experience sampling, parameter  $S$  should be greater than zero. If investors are subject to the primacy bias, we should observe that the parameter  $A$  is greater than zero (because  $w_1 > \frac{1}{n}$ ). Therefore, our hypothesis to test these predictions is:

H1 (Primacy effect): *If an investor is subject to experiential learning with the primacy bias in deciding to re-enter the stock market, then holding the average return fixed, the odds of stock market re-entry will increase with the initial return.*

In order to differentiate further the primacy hypothesis from the salience hypothesis (Bordalo, Gennaioli and Shleifer, 2012), we have the following corollary:

H1a (Primacy effect vs. Salience effect): *If the initial return is prevalent in re-entry decision due to the primacy effect, it should prevail even after controlling for the extent to which the initial return is salient.*

We also want to establish whether the sensitivity parameter  $S$  is constant, irrespective of the sign of initial returns ( $r_1$ ). Two opposing theories may explain the sensitivity of investors' behaviour to past returns. One is the theory of *loss aversion* (Kahneman and Tversky, 1979), which implies that the disutility of losing is greater than the utility of winning. This theory predicts that the likelihood of re-entry drops with the magnitude of the loss more than it increases with the magnitude of the gain. That is, the sensitivity of re-entry probability is higher to negative returns than to positive returns. This phenomenon is documented by Strahilevitz, Odean, and Barber

(2011) in the context of investors' decisions to repurchase stock. The other is the theory of *self-attribution* (Daniel, Hirshleifer, and Subrahmanaym, 1998) which, in contrast to loss aversion, predicts that investors respond more sensitively to positive returns, as they tend to attribute successes to skill but ascribe failures to luck. Ben-David, Birru, and Prokopenya's (2016) evidence for this theory shows that retail traders in Forex futures markets react more strongly to positive past outcomes than to negative outcomes. Therefore, our second hypothesis is:

*H<sub>2</sub>: If an investor is subject to experiential learning with the primacy bias in deciding to re-enter the stock market and responds to this experience asymmetrically, then holding the average return fixed, the sensitivity of the odds of stock market re-entry to initial returns differs depending on the return domain.*

#### **4. Data, sample construction, and main variables**

We use transaction data from the Finnish stock market, which have been exploited in previous literature (e.g., Grinblatt and Keloharju, 2000, 2001a, 2001b; Seru, Shumway, and Stoffman, 2010; Linnainmaa, 2011; Kaustia and Knüpfer, 2012). These are provided by the Finnish Central Securities Depository (FCSD) and cover every market transaction by every stock market participant in all Finnish stocks over a nine-year period from January 1995 to December 2003.<sup>10</sup> The database covers 97% of the total market capitalization of Finnish stocks and gives a comprehensive picture of direct shareholdings. Indirect stock market participation through mutual funds is not captured in the data, but indirect shareholdings are minimal, especially during our sample period, since mutual funds did not gain in popularity until 2003 (see e.g., Kaustia and Knüpfer, 2012). The data also record various investor characteristics, such as gender, age, and zip

---

<sup>10</sup> The data include trades on foreign exchanges of Finnish stocks if they are listed on the Helsinki Stock Exchanges. For example, Nokia has trading of similar magnitude on both the Helsinki Stock Exchange and the New York Stock Exchange.

code. For the purpose of examining household investors' behaviour, we focus only on entries recording transactions placed by individual investors.

Based on investors' transaction records, we identify those who entered and subsequently exited the stock market during our sample period. To this end, we first remove investors who opened a brokerage account before 1995 because they may have traded previously.<sup>11</sup> Then, for each investor, we record the *entry time* as the first calendar month in which investors purchase stocks for the first time, and the *exit time* as the calendar month in which they sell all of their stock holdings for the first time. We do not consider investors who never exit the stock market.<sup>12</sup> For investors who exit the market, we also trace whether and, if so, when they return to the market. We record the *re-entry time* as the first calendar month in which investors purchase any stock after the exit. In order to select only investors who are choosing to exit, rather than rebalancing their portfolios, we do not consider investors who re-enter the market within one calendar month of their exit.

Next, we measure each individual's experience of participating in the stock market based on average monthly returns – referred to as *all returns* – during their stay in the market. We first obtain a time series of monthly (raw) returns in each month, for which we compute the realized return for the case of round-trip trades, and the unrealized return otherwise. We then weight monthly returns by the monthly investment amount. Returns in the first (i.e., entry) and last (i.e., exit) months of investing are referred to as *initial returns* and *recent returns*, respectively. We

---

<sup>11</sup> The investor identifier in our database is *Owner Code* (OCODE), into which investor transactions and holdings across brokerage accounts are aggregated for the same investor. By considering only investors whose OCODE does not exist (and who hence must not have traded any stock) before the start of our sample period (1995), we ensure that investors' entry to and exit from stock markets for the first time since 1995 reflect their initial stock experience.

<sup>12</sup> This procedure for sample selection may cause selection bias in our inferences. Issues of sample selection are dealt with in greater depth in Section 6.

measure monthly returns as opposed to realized returns on actual holding periods of participation because it would be difficult to compare the returns across investors with different participation lengths. More importantly, employing the realized return variable would generate an endogeneity problem in our analysis because investors' decisions to exit the stock market are not randomly assigned.

We construct our final sample as monthly panel data, which are tailored to the logit estimation of a discrete-time hazard model. A non-re-entering investor has monthly observations from the month following exit through to the end of our sample period (i.e., December 2003), while a re-entering investor keeps observations only until the re-entry month, and any further observations are dropped. Our final sample consists of 276,470 investor months with 9,435 retail investors who collectively traded 176 different publicly-listed Finnish stocks. In addition to our main sample, we also exploit a larger sample of investors to estimate the two-stage Heckman (1976) selection model, for which we estimate the probability of investors' exit in a first-stage regression using a sample constructed similarly to our main sample, comprising 3,482,779 investor months with 97,539 retail investors.

Our dependent variable is a dummy variable,  $Re-entry_{it}$ , which is equal to 1 if investor  $i$  re-enters the market in month  $t$ , and zero otherwise. Our main explanatory variable of interest is initial returns ( $IniRet_i$ ), and the key control variable is all returns ( $AllRet_i$ ), both of which are time-invariant for our analysis.  $Saliency_i$  captures how different the initial return is relative to all other returns, computed as the distance (in percentage terms) between the initial return and the average return for the duration of investing. Other experience measures include recent returns ( $RecRet_i$ ), realized returns ( $RealRet_i$ ), investment size ( $InvSizi$ ), the number of trades ( $ZeroTrdi$ ), the number of stocks ( $SglStocki$ ), and Nokia investors ( $Nokiai$ ). More specifically,  $InvSizi$  is defined as the log



of average portfolio holdings, and  $ZeroTrd_i$  is a dummy variable that equals 1 if an investor never trades between entry and exit months, and zero otherwise.  $SglStock_i$  is a dummy variable equal to 1 if an investor trades only one stock during the time in the stock market. We consider a set-up of dummy variables (rather than continuous variables) to account for the number of stocks and trades because most investors in our sample (about 70%) only own one stock and do not trade at all.  $Nokia_i$  is a dummy equal to 1 if an investor initiates stock investment by purchasing Nokia stock. We use this variable because Nokia is by far the largest firm in the Finnish market, accounting for 36% of the total stock market capitalization on average during the sample period. We also construct a dummy variable ( $Vicinity_i$ ) indicating whether an investor resides in the same municipality that the corporate headquarters of the company whose stocks she holds is located in. This variable is used in our main analyses to take into account the possibility of investors being under employee stock-ownership plans. We compute for idiosyncratic volatility/skewness ( $IVol_i$  and  $ISkew_i$ ) of the initial stock as well as stock market returns on-, before-, and after the entry time ( $Mkt\_entry_i$ ,  $Mkt\_bfi$ , and  $Mkt\_afi$ ).  $Ret\_entry_i$  is the past 3-month return of the initial stock, and  $Value$  is the indicator of the initial stock being a value stock (i.e., the book-to-market ratio is higher than the sample median).

We consider two time-varying covariates, Finnish stock market return ( $MktRet_t$ ) and volatility (i.e., standard deviation of daily returns for the month) ( $MktVol_t$ ) computed using the prices of the OMX Helsinki Index, as well the investor demographics of age ( $Age_i$ ) and gender ( $Female_i$ ).  $Minor_i$  is a dummy variable that equals 1 if the account holder is below 16 years of age.<sup>13</sup> We consider this variable because under-age accounts may be distinctive, given that a high

---

<sup>13</sup> The variable of *Age* captures the age of the investors *at the beginning of the sample* since there is relatively little variation in its value over time. However, we calculate the actual age (not at the beginning) to construct the *Minor*-dummy variable.

proportion of such accounts in Finnish stock markets are managed by *informed* parents or guardians who have had previous success in picking stocks (Berkman, Koch, and Westerholm, 2014). *Optioni* is a dummy variable that equals to 1 if an investor ever traded an option during our sample period, which is employed as a measure of financial sophistication. To account for the fact that the Finnish stock market boomed and tanked around April 2000, we also include a dummy variable, *Bursti*, which is equal to 1 if the time under consideration is later than the month of the dotcom bubble burst (April 2000).

Panel B of Table 1 presents the summary statistics for the panel data of our sample that consist of 276,740 investor-months. Regarding investor characteristics, females make up 30% of total accounts, the median age is 36, 5% of investors are minor, and 27% of them reside in the Helsinki area. Notably, a majority (71%) of investors own only one stock, and three quarters of them do not trade at all between their initial purchase and market exit.<sup>14</sup> Interestingly, 37% of investors choose to buy Nokia for their initial trading. Initial investment sizes ( $= e^{InvSiz}$ ) are on average a little over €2,000, and 80% of sample observations post-date the burst of the bubble. The mean of initial returns is 1.20%, with 4.42%, 6.56%, and 6.28% for all returns, recent returns, and realized returns, respectively. Panel C reports the correlation matrix for the main explanatory variables included in Equation (4).

[Insert Table 1 here]

---

<sup>14</sup> A large proportion of inactive investors in our final sample are also observed with the population of Finnish retail investors. For instance, using the same dataset as ours, Linnainmaa (2011) reports that 47.9% of all 1.1 million individuals with any stockholdings never trade during the eight-year sample period, and three fifths of all trading activity come from just 5% of the most active investors. Given this composition of our sample, the primacy effect we document may well be related to inactive investors (or, inexperienced households with the low level of financial sophistication), the group of investors among which this behavioural bias (e.g., as naïve reinforcement learning) is documented to be pronounced (see, e.g., Chiang, Hirshleifer, Qian, and Sherman, 2011).

## 5. Initial returns and stock market re-entry

In this section, we present the main results of a hazard model for the relation between initial returns and the probability of stock market re-entry. Before presenting the main results of multivariate analysis, we present a preliminary result using simple univariate analysis, in which we relate the proportion of re-entering investors to their initial returns. Specifically, we first sort investors in our sample into ten groups based on their initial returns (groups 1 to 5 for negative returns and groups 6 to 10 for positive returns). We then compute the proportion of re-entering investors and the average initial return for each category. For example, group 1 (group 10) consists of 336 (615) investors who experienced extremely negative (positive) returns lower than -20% (higher than +20%), of whom 22% (41%) re-entered the market. Group 5 (group 6) constitutes 1,270 (1,279) investors whose initial returns range from -5% to 0 (0 to 5%), of whom 37% (36%) returned.

In plotting the proportion of returning investors by initial return group (Figure 1a), a strengthening relation emerges between the two: the re-entry proportion tends to be higher for groups of investors with larger initial returns. We also draw this graph separately for Nokia investors and for Non-Nokia investors, and find two interesting results. First, the pattern between re-entry proportion and initial returns is more pronounced for non-Nokia investors (Figure 1b) than for Nokia investors (Figure 1c). Second, looking at the re-entry proportion across investor types (Nokia versus non-Nokia), Nokia investors are more likely to return to the market than non-Nokia investors, even though the two types of investor experienced similar levels of initial returns. Taking group 6 as an example, the average initial return is the same (about 2%), but there is a wide gap in the proportion of re-entry between the two (22% for non-Nokia versus 54% for Nokia). Such patterns could emerge for different reasons. Part of the reason why Nokia investors are more

likely to re-enter could be due to the confidence in Nokia that is Finland's national champion,<sup>15</sup> regardless of its performance. It might also be related to the availability bias (Tversky and Kahneman, 1974), whereby investors tend to choose investments based on information that is readily available to them. Since Nokia accounts for a large chunk of the public information pool in Finland, there would be more news and chatter (maybe in social gatherings - peer effects) about Nokia, which would prompt people to invest in Nokia despite their earlier losses. Last but not least, a loss in a Nokia stock investment in the first trial might be seen as low market performance (hence unlucky) rather than low stock picking ability.

[Insert Figure 1 here]

While the results of univariate analysis are informative, this method has limitations in providing a complete picture of the relation between initial returns and re-entry. For instance, it cannot account for time-varying covariates (e.g., stock market condition) or time-invariant investor characteristics (e.g., age, gender, and income), which may affect investors' decisions to return to the stock market. More importantly, it does not take into account a potential *censoring bias* that arises from our sample being right truncated: it is unknown whether a non-returning investor in our sample will re-enter the market after the end of our sample period. The censoring issue is particularly problematic when the sample period is relatively short. To remedy these drawbacks of univariate analysis, we employ a monthly hazard model based on the technique of survival analysis.

---

<sup>15</sup> According to the Economist (2012), Finland's fortunes rely on one firm, such that Nokia contributed a quarter of Finnish growth from 1998 to 2007, and over the same period, Nokia's spending on R&D was one third of the country's total spending, and it generated nearly one fifth of the nation's exports.

### 5.1 The effect of initial returns

In this section, we report the main results of a monthly hazard model estimated using a multiperiod logit regression with a parametric (linear) duration distribution as follows:

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{DurAway}_{i,t} + \beta_4 \text{Controls}_{i,t} \\ & + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{time} \\ & \text{fixed effect}) + \epsilon_{i,t} \quad (4) \end{aligned}$$

*Re-entry* is equal to 1 if investor  $i$  re-enters the market in month  $t$  by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, our main explanatory variable of interest, is the return in the first month of investing. *AllRet*, our main control variable, is the value-weighted average of monthly returns during the entire period of investing between entry and exit. *DurAway* is the length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month  $t$ . In addition to year-fixed effects, we account for the fixed effects of investment size, location of residence, and exit time by including dummies for average portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively. The first two fixed effects are included to mitigate heterogeneity in investors' wealth, and the last seeks to account for the fact that investors exiting at different times may have different reasons for leaving. The standard errors are clustered at the investor level.

With respect to other control variables, we consider aspects of investment experience other than returns, investor demographics (age and gender), and time-varying market conditions. Specifically, the log value of average portfolio holdings (*InvSiz*) is used to proxy the level of investor income or wealth to account for the wealth effect. We include dummy variables to account for inactive investors (*ZeroTrd* and *SglStock*) to account for the fact that these investors may have different motivations from those who invest in even a small portfolio. Since our univariate analysis hints that Nokia investors may act differently from non-Nokia investors, we also control for *Nokia*.

To address the time-varying condition of the Finnish stock market, we include the lagged value (by one calendar month) of market return (*MktRet*) and volatility (*MktVol*), computed using the OMX Helsinki Index, and a dummy variable (*Burst*) indicating the period after the stock market bust in early 2000.

We present the main results from estimating a hazard model using Equation (4) in two tables. Table 2 presents the model without the control variable, *AllRet*, while the model in Table 3 includes *AllRet*. Each table has four specifications (Models 1 to 4), depending on the chosen set of control variables. We include six variables – *MktRet*, *MktVol*, *Female*, *Age*, *Burst*, and *DurAway* – and the aforementioned fixed effects throughout the specification, while experience measures other than returns – *InvSiz*, *ZeroTrd*, *SglStock*, and *Nokia* – are considered in order. The coefficients of our main variable (*IniRet*) – being reported in terms of the odds ratios – are consistently positive and statistically significant, irrespective of controlling for other experience measures and accounting for the fixed effects of investment size, exit time, and zip code. The economic magnitude of the coefficients is interpreted as one unit increase in *IniRet* leading to an increase in the estimated odds of re-entry by 1.44 to 1.68 times. For the investor who has the sample average of re-entry probability (36.57%), this impact amounts to more than 16 percentage points increase in re-entry rate.

[Insert Table 2 here]

The coefficients of the *SglStock* and *ZeroTrd* variables reveal interesting results. The odds ratio of *SglStock* is smaller than one (i.e., the logit coefficient is negative), as it is for the interaction of *SglStock* with *ZeroTrd*. This suggests that investors who own a single stock *and* do not trade at all between their initial purchase and market exit – referred to as *try-out investors* – show a stronger tendency not to return to the market after withdrawing from it for any reason. Such patterns may

arise due to different reasons. First, it is conceivable that those investors are financially illiterate compared to their peers investing actively in multiple stocks, and such investors with low literacy are found to be much less likely to participate in the stock market (van Rooij, Lusardi, and Alessie, 2011). Alternatively, it may be related to their motivation of trading stocks in the first place. For example, they may have held stocks of their company as part of an employee stock-ownership scheme, or, it is possible that they inherited it from a deceased relative. The issue of inheritance, however, is not likely to affect our results as we only have a few inheritance cases (less than 1% of investors) in our sample. As for the employee stock-ownership plan, it is plausible that part of our investors are employee-investors which we cannot know with certainty due to data unavailability. But, we will take this issue into consideration later by creating a proxy for employee stock ownership.

For other variables, we observe a positive relation (i.e., the reported odds ratio being greater than one) for *InvSiz* and *Nokia*, but a negative relation for *MktRet*, *MktVol*, *Female*, *Age*, *Burst*, and *DurAway*. The result for *Female* indicates a gender difference in re-entry suggesting that female investors are less likely to (re-)enter the stock market, which is in line with the finding of Barber and Odean (2001) that men are overconfident, and hence trade more than women. The positive coefficient of *InvSiz* may imply that affluent individuals are more apt to invest in financial markets,<sup>16</sup> and the negative coefficient of *DurAway* implies that investors will return to the stock market sooner rather than later. The result for *Burst* reveals that after controlling for initial returns and exit time (among others), investors are less likely to (re-)enter the market during the period when the Finnish stock market plummeted (i.e., the post-crash period). The greater tendency for

---

<sup>16</sup> The positive relation between investment size and re-entry likelihood is in line with our (unreported) estimated coefficients for the investment size dummies in the regression. We observe a monotonically increasing relation between the magnitude of the five coefficients and the size quintile dummy.

Nokia investors to return to the market is in line with the univariate analysis results presented earlier, in which the proportion of re-entering investors was much higher for Nokia investors than for non-Nokia investors, regardless of initial returns. The negative effect of *MktVol* on re-entry indicates investors' reluctance to stock investing during a turbulent time. The negative relation between *MktRet* and *Re-entry* is, however, hard to understand because it suggests positive (negative) market performance for a prior month decreases (increases) the probability of re-entry. This negative relationship may be due to investors' hesitancy about buying stocks whose prices they may think are too high, as high lagged market returns render stocks more expensive on average. Investors may want to wait for the prices to start falling, which is expected to happen, on average, during a market downturn.

## 5.2 Beyond initial returns: Average, recent, and realized returns

The results presented in Table 2 suggest that initial returns strongly influence investors' decisions to return to the stock market after withdrawal and absence from it. However, the particular importance of initial returns themselves is not evidenced by this result alone, since investors' entire holding period is much longer than a month and, more importantly, the average return during that period (*AllRet*) may be correlated with the return in the first month. Therefore, it is necessary to control for *AllRet* in regressions otherwise identical to those considered in Table 2. If investors place greater weight on returns in the first month of investing than on returns in subsequent months, we should *still* observe a significantly positive coefficient for *IniRet*. In fact, the coefficients for *IniRet* remain positive and statistically significant, even after controlling for *AllRet*, regardless of model specifications (Table 3). In contrast, the effect of *AllRet* is much weaker in terms of both magnitude and statistical significance. This finding suggests that initial returns



are not only robust, but have a dominant effect after including average monthly returns during the entire period of investment.

[Insert Table 3 here]

Next, we consider returns in the last month of investing (*RecRet*) as an important additional control variable. Use of this variable is based on the so-called *recency effect* in psychology literature (e.g., Hogarth and Einhorn, 1992) that proposes a salient effect of the last in a series of experiences (as opposed to the first experience in the primacy effect). With regard to the finance literature, Nofsinger and Varma's (2013) result implies that investors' recent experience is relevant and may dominate earlier experiences in influencing decisions to repurchase stock. In the context of our analysis, the return in the last month of investing (i.e., the exit month) serves as the last, and also most recent, experience before investors' decisions to return to the market following withdrawal and absence. Therefore, if the primacy effect is dominated by the recency effect, we should observe that the effect of initial returns is subsumed by the inclusion of recent returns as a control variable.

[Insert Table 4 here]

Table 4 presents the results of our regressions while controlling for *RecRet* (and *AllRet*), which are otherwise identical to the regressions considered in Table 3. Our earlier results with initial returns are robust to the inclusion of *RecRet*, except that the magnitude of their coefficients decreases slightly. In contrast, the coefficients for recent returns are at best weakly significant (Models 1 and 2) and their sign is negative, regardless of model specification, in contrast to the positive sign for initial returns. The negative influence of recent returns on stock market re-entry does not seem intuitive, which may be because our recent return variable is endogenous. By construction, it is a measure of *realized* return (whereas initial returns are usually *unrealized*);

hence, it is a function of when the investor chooses to sell and exit the market. In a similar vein, this explains why, after accounting for realized recent returns, the coefficients for *AllRet* become more significant.

Lastly, we want to see whether the importance of initial returns in re-entry decisions is affected by *realized* returns over the entire period of investing (i.e., from entering through to exiting the market). It is conceivable that the re-entry probability for investors is also influenced by their previous experience upon selling (and exiting), as it may affect investors' disposition towards equity investing and hence, their re-entry. To investigate this issue, we also construct and control for the realized return on the actual investment period (*RealRet*) in the regressions. This setting would enable us to see the effect of initial returns vis-à-vis realized returns. New results reported in Table 5 show that realized returns have a significantly positive effect on the re-entry probability. However, importantly, the inclusion of the realized return variable does not subsume the effect of initial return.

[Insert Table 5 here]

In summary, the results presented so far suggest that a larger initial return is associated with a higher hazard probability of an investor returning to the stock market, and that this is the case even after controlling for recent returns as well as average returns and/or realized returns for the investment period. This finding is consistent with our first hypothesis (H1) that investors are subject to experience-based learning and their initial experience has a particularly strong influence on their decisions to return to the stock market after withdrawal and absence from it for a while.

### 5.3 Primacy vs. Saliency<sup>17</sup>

The salience theory of choice (Bordalo, Gennaioli and Shleifer, 2012) implies that an investor pays more attention to salient returns, which is defined as such returns that are much different from the realized path of returns for the investor. If this is the case, it would be possible that initial returns are overweighed by the investor not because it is the first return experience, but because it is a very different experience relative to all other experiences. To disentangle the primacy explanation from the salience hypothesis, we want to examine whether the initial return variable will survive even after controlling for the extent to which it is salient. As postulated in our hypothesis H1a, the idea is that if the initial return – market re-entry relation is to be attributed to the primacy effect as opposed to the salience effect, the initial return effect should remain significant even after controlling for the extent to which the initial return is salient (or, different from other return experiences).

Based on Bordalo, Gennaioli and Shleifer (2012), we construct a salience measure (*Saliency*) assuming that the initial return is salient if it is very different (in percentage terms) from all other returns. In doing so, we first compute the absolute difference (or, distance) between the initial return and the average return for the duration of investing. Then, we scale this to have percentage terms by the absolute value of average return. As shown in Table 6 for new regression results, our salience variable for initial return carries positive and statistically significant coefficients regardless of model specifications. This implies that an investor tends to overweigh initial returns more when it is very different or salient, which is consistent with the salience theory of choice. More importantly, our initial return variable remains intact after the inclusion of the

---

<sup>17</sup> We thank the anonymous referee for raising this issue.

salience measure, which suggests the primacy effect we consider in this paper is unlikely to be driven by the salience effect.

[Insert Table 6 here]

#### 5.4 Sensitivity of re-entry to initial returns: Losses versus gains

In this section, we explore whether investors learn *differently* from experiences of initial returns, depending on whether they are negative (losses) or positive (gains). To test the potentially asymmetric pattern of investor learning from initial returns, we run the following piecewise regression by interacting our initial return variable with a dummy variable for each domain of initial returns in a regression model otherwise identical to Equation (4):

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i \times I(\text{IniRet}_i \geq 0) + \beta_2 \text{IniRet}_i \times I(\text{IniRet}_i < 0) + \beta_3 \text{AllRet}_i + \\ & \beta_4 \text{DurAway}_{i,t} + \beta_5 \text{Controls}_{i,t} + (\text{investment-size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit-} \\ & \text{month fixed effect}) + (\text{time fixed effect}) + \epsilon_{i,t} \end{aligned} \quad (5)$$

$I(\cdot)$  is the indicator function, where  $I(\text{IniRet} \geq 0)$  takes a value of 1 if the initial return is zero or positive, and 0 otherwise. The coefficients of interest are  $\beta_1$  and  $\beta_2$ , which provide information on the domain (loss versus gain) in which the hazard rate of re-entry is more sensitive to initial returns.

[Insert Table 7 here]

The results provided in Table 7 show that  $\beta_1$  is positive and statistically significant, whereas  $\beta_2$  is insignificant, suggesting that the influence of initial returns is salient when they are positive. Specifically, the odds ratio ranging from 1.58 to 1.91 is interpreted as a one-standard-deviation increase in *IniRet* gains (nine percentage points) being associated with an approximately four to six percent increase in the hazard probability of re-entry. Our finding on individuals' asymmetric learning behaviour is consistent with the prediction of the *self-attribution* model (Daniel, Hirshleifer, and Subrahmanyam, 1998; Gervais and Odean, 2001) for individuals' decision making: individuals tend to attribute successes to their own skill but ascribe failures to bad luck.

In other words, positive returns give investors enhanced perceptions of their skills, to which they respond more sensitively. In line with our results, Ben-David, Birru, and Prokopenya (2016) find that retail investors in Forex futures markets react more strongly to positive past outcomes than to negative outcomes. This result supports our second hypothesis (H2) that investors' experiential learning is asymmetric.

### 5.5. *The effect of initial returns by investor type*

In this section, we examine whether the effect of initial returns on re-entry decisions is more pronounced for certain types of investor in our sample. In particular, we consider the following three types of investor according to their investing characteristics: (i) those owning one stock (*SglStock*=1); (ii) those purchasing Nokia stock (*Nokia*=1); and (iii) those who are under age (*Minor*=1). We examine these characteristics of investors especially because their motivations for exiting and re-entering the stock market may be very different from those of other investors. For example, investors who buy one stock, sell it, and do not reinvest again may be different from those who invest in even a small portfolio. Similarly, non-Nokia investors may differ from Nokia investors, especially since Nokia is such a prominent stock that it captures almost 36% of the total market capitalization of the Finnish stock market. Lastly, under-age accounts may be distinctive, given that a high proportion of such accounts in Finnish stock markets are managed by *informed* parents or guardians who have had previous success in picking stocks (Berkman, Koch, and Westerholm, 2014). In addition to these characteristics, we also test whether the relation depends on investors' portfolio values (*Inv\_Size\_H*=1), demographics (e.g., *Female*=1, or *Old*=1), and locations (*Helsinki* = 1).

[Insert Table 8 here]

Table 8 presents the results of a regression in which we interact our initial return variable with various dummy variables, each indicating one of the aforementioned types of investor. The positive coefficient for  $IniRet \times SglStock$  suggests that the influence of initial returns on investors' re-entry decisions is stronger for those who invest in only one stock between initial purchase and market exit. This result may be due to that such investors are *trying out* their investment on a "suck-it-and-see" principle. One can also think that they are more naïve (in financial terms) compared to their multiple-stock holding peers, and hence more prone to behavioural biases. Alternatively, those investors are more affected by initial returns because it is easier to recall the initial return of one stock than the initial returns of many stocks. It is interesting to see that the significance of  $IniRet$  itself becomes attenuated after the inclusion of  $IniRet \times SglStock$  in the regression, which indicates the primacy effect is pertinent to those investors with a single stock.

It is also seen that Nokia investors are less likely to be affected by initial returns (i.e., a negative coefficient for  $IniRet \times Nokia$ ). This phenomenon may be explained by individuals' *self-serving* bias, which leads them to ascribe any successes or failures from investing in such a prominent stock *less* to their skills, compared to a lesser-known stock that may require some prior knowledge or skills. We also find very strong evidence that initial returns do not greatly affect the under-age group of investors (i.e., a negative coefficient for  $IniRet \times Minor$ ), which, along with our results for  $IniRet \times SglStock$ , support the view that more informed or financially sophisticated investors are less subject to the primacy bias. In contrast to these results, the interaction terms with  $InvSize\_H$ , *Female*, *Old*, or *Helsinki*, are not significant, suggesting that the primacy effect does not appear to be more pronounced for any particular group of investment size, gender, age, or location.

## 6. Alternative explanations

### *6.1 Investor wealth*

In order to free our analysis from endogeneity, we would need to control for heterogeneity in investor wealth in our regressions, which we cannot do because the data are unavailable to us. This is because investors' earlier investments induce changes in their (financial) wealth, which in turn affect their likelihood of returning to the stock market. However, we argue that our results are less likely to be contaminated by endogeneity because we already control for the average return for the entire period of investing in the stock market. To further address the issue of the wealth effect, we mitigate wealth heterogeneity by running all our regressions while accounting for two fixed effects, zip code and investment size. By exploiting variation within district (as opposed to across 100 districts), and within groups of investors with the same investment size, we seek to diminish the wealth gap among investors considered in our analyses. We also include, as an additional control variable, the average value of investors' portfolio holdings during the period of investing in the stock market.

### *6.2 Investor skill or financial sophistication*

Informed and financially sophisticated investors are known to participate more actively in the stock market. They are also more likely to secure better investment performance by exploiting private information or superior financial knowledge. Therefore, one might argue that our results on the positive relationship between initial returns and the likelihood of re-entry are not driven by investors' primacy bias, but by investors with high initial returns being better informed. But, we find this argument tenuous because the fact that initial returns are defined as month 1-returns suggests an informed investor should realize superior returns during the first month of their investments, something not necessarily intuitive or expected. Furthermore, we control for average

monthly returns during the entire period of investing between entry and exit, which would capture investors' skill or ability to some extent.

### *6.3 Indirect investment*

It may be beneficial to know about individuals' mutual fund investments because the exiting investors in our sample may have switched from individual securities to diversified funds. However, mutual fund investments were very small in Finland until 2003 (see e.g., Kaustia and Knüpfer, 2012), which coincides with the end of our sample period. Furthermore, examining direct stock investments is important because previous research suggests that the delegation of investment may involve investors incurring high management fees (as the price for mutual funds' active management) that may thus, prevent them from realizing the equity premium offered by equity markets (see e.g., Malkiel, 2013).

### *6.4 Employee stock-ownership plan<sup>18</sup>*

It is plausible that investors may hold their company's stocks due to its employee stock-ownership plans. Though we have not taken into consideration the employee stock-ownership plan for our main analysis due to data unavailability, it should be somehow dealt with because investors under such a plan could have different motivation to participate in the stock market. To mitigate this concern, we want to get around the data unavailability issue by identifying the case of employee stock-ownership plans, based on the distance between the locations of investor residency and the company's headquarters. More specifically, we construct a dummy variable (*Vicinity*) indicating whether an investor resides in the same municipality where the headquarters of the company (whose stocks she holds) is located. The idea is that an investor is more likely to be an employee if she resides in the vicinity of a company than an investor who lives far away from it.

---

<sup>18</sup> We thank the anonymous referee for raising this issue.



The regression results reported in Table 9 show that the initial return effect remains robust to controlling for this vicinity variable.

[Insert Table 9 here]

## 7. Robustness: Sample selection

An investor's initial entry decision may not be random as it can be a function of the investor's risk preferences, investing style (e.g., momentum/contrarian-, or value/growth investing), or the entry time can be correlated with other variables such as the macroeconomic environment and labour market outcomes (see, e.g., works cited in Campbell, 2006; Badarinza, Campbell and Ramadorai, 2016). If this is the case, our initial return variable is endogenous which may bias our inferences. To alleviate this concern, we first try to control for investors' risk preferences based on risk characteristics (such as idiosyncratic volatility/skewness) of the stock they chose for their initial investment. The rationale is that investors' risk preferences should be reflected in their decision on which stocks to buy in the first place.<sup>19</sup> Second, we try to exogenize the entry time by controlling for stock market returns around the entry time, i.e., a month before- and after the entry month as well as the entry month. Third, we account for the effect of prior stock performance and book-to-market ratios of the stock to gauge whether investors' susceptibility toward the primacy bias is linked to momentum/contrarian and value/growth styles. New results show that the initial return – re-entry relation is robust to controlling for the initial stock's characteristics and stock market conditions around initial entry time.<sup>20</sup>

Sample selection biases could also arise due to investors' exiting decision being potentially endogenous, as we only take into consideration for our sample investors who chose to exit the

---

<sup>19</sup> We are not able to employ the variable of investor wealth, which could be an alternative candidate for the risk-preference proxy, due to data unavailability.

<sup>20</sup> Detailed results (A.1) are tabulated in an appendix that is available upon request.

stock market. To alleviate this concern, we first check how different our sample is compared to a larger population of retail investors in Finland. For this purpose, we report in Panel A of Table 1 sample characteristics for all investors in our database as well as our primary sample. The results show that there is no marked difference between the two groups, especially for the variables that we do not control for in our regressions. Furthermore, we employ a two-stage Heckman (1976) model to the sample of whole population of retail investors in Finland, which includes both exiting- and non-exiting investors. The results confirm that the initial return-re-entry relation remains intact after accounting for the potential effect of the non-randomly chosen sample.<sup>21</sup>

## 8. Conclusion

Using a detailed dataset that gives a comprehensive picture of retail investors' transactions and direct shareholdings in the Finnish stock market from 1995 to 2003, we find that their initial investment experience strongly influences their decisions to return to the stock market after withdrawal and absence from it. More specifically, investors who experience lower *initial returns* (returns in the first month of investing) are less likely to return to the market, even after controlling for *recent returns* (returns in the last month of investing) as well as *all returns* (average returns for all months of investing). These results are consistent with the *primacy effect*, whereby individuals

---

<sup>21</sup> Detailed results of the Heckman (1976) correction are tabulated in an appendix (A.2 and A.3 for the first- and second stage regression, respectively), which is available upon request. In A.2, we observe that initial returns are negatively related to re-entry, confirming that initial returns matter not only to investors' decisions to re-enter the market, but also to decisions to exit. Interestingly, recent returns are shown to have a positive coefficient, which may be related to the disposition effect (e.g., Shefrin and Statman, 1985). Notably, the coefficient on *Inherit*, which is a dummy variable equal to 1 if an investor inherited the stock within the past 12 months, and 0 otherwise, (this variable is used as an instrument to meet an *exclusion restriction*) is negative. That is, people are more (less) likely to stay (exit) in the market if they inherit the stock, the finding which can be linked to status quo bias (Samuelson and Zeckhauser, 1988), whereby investors prefer for the existing condition (i.e., inherited stock positions) to stay the same without bringing about change (i.e., unwind the existing positions). For A.3, where we estimate the model using the random-effects logit specification to mitigate the incidental parameter problem (Neyman and Scott, 1948), we find the probability of exit (i.e., the inverse Mill's ratio,  $\lambda$ ) is negatively related to re-entry, indicating that our sample is not randomly selected. More importantly, however, the coefficients of our main variable remain intact even after controlling for  $\lambda$  (i.e., correcting for potential selection bias).

tend to rely more on initial experiences than on subsequent ones due to a cognitive bias associated with memory (*primacy bias*).

Our findings of the primacy bias being pronounced particularly among less sophisticated (single-stock) investors highlight the relevance of financial literacy to increased stock market participation by households. To the extent that initial success or failure has a considerable influence on investors' later market participation, financial literacy programmes should pay particular attention to first-time stock buyers, and encourage them to invest wisely with a longer-term perspective. In this way, the stock market might retain more of its original investors, enabling them to transfer their wealth to a period when it will be most valued, during their retirement years.

When investors decide to exit the stock markets individually, they have other market choices to invest in such as bond markets, housing markets, etc. This paper examines investors' exit decisions but does not investigate their further decisions such as investing in alternative asset classes. It is therefore a fruitful area for future researchers to examine factors behind switches from equity markets to alternative markets especially in the context of behavioural biases, one of which is examined in this paper.

## References

- Anagol, Santosh, Vimal Balasubramaniam, and Tarun Ramadorai, 2015. The effects of experience on investor behavior: Evidence from India's IPO lotteries. *Research paper*. <http://dx.doi.org/10.2139/ssrn.2568748>.
- Asch, Solomon E., 1946. Forming impressions of personality, *Journal of Abnormal and Social Psychology* 41, 258-290.
- Ashton, Alison H., and Robert H. Ashton, 1988. Sequential belief revision in auditing, *Accounting Review* 63, 623-641.
- Badarinza, Cristian, John Y. Campbell, and Tarun Ramadorai, 2016. International comparative household finance, *Annual Review of Economics* 8, 111-144.
- Baltussen, Guido, 2009, Behavioural Finance: An Introduction. Working paper. <https://ssrn.com/abstract=1488110> or <http://dx.doi.org/10.2139/ssrn.1488110>
- Barber, Brad M., and Terrance Odean, 2001. Boys will be boys: Gender, overconfidence, and common stock investment, *Quarterly Journal of Economics* 116, 261-292.
- Baumeister, Roy F., Ellen Bratslavsky, Catrin Finkenauer, and Kathleen D. Vohs, 2001. Bad is stronger than good, *Review of General Psychology* 5, 323-370.
- Ben-David, Itzhak, Justin Birru, and Viktor Prokopenya, 2016. Uninformative feedback and risk taking: Evidence from retail forex trading, *National Bureau of Economic Research Working Paper* w22146.
- Berkman, Henk, Paul D. Koch, and P. Joakim Westerholm, 2014. Informed trading through the accounts of children, *Journal of Finance* 69, 363-404.
- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer, 2012. Salience Theory of Choice Under Risk. *Quarterly Journal of Economics* 127, 1243-1285.
- Brown, George W., 1951. Iterative solution of games by fictitious play, in Tjalling C. Koopmans (ed.), *Activity Analysis of Production and Allocation*, (Wiley, New York), 374-376.

- Busemeyer, Jerome R., and Julie C. Stout, 2002. A contribution of cognitive decision models to clinical assessment: Decomposing performance on the Bechara gambling task, *Psychological Assessment* 14, 253-262.
- Campbell, John Y, 2006. Household Finance, *Journal of Finance* 61, 1553-1604.
- Campbell, John Y., Tarun Ramadorai, and Benjamin Ranish, 2014. Getting better or feeling better? How equity investors respond to investment experience, *National Bureau of Economic Research Working Paper* 2000.
- Carney, Dana R., and Mahzarin R. Banaji, 2012. First is best, *PLOS ONE* 7, 1-5.
- Chiang, Yao-Min, David Hirshleifer, Yiming Qian, and Ann E. Sherman, 2011. Do investors learn from experience? Evidence from frequent IPO investors, *Review of Financial Studies* 24, 1560-1589
- Choi, James J., David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2009. Reinforcement learning and saving behavior, *Journal of Finance* 64, 2515-2534.
- Chordia, Tarun., Richard Roll, and Avanidhar Subrahmanyam, 2011. Recent trends in trading activity and market quality. *Journal of Financial Economics* 101, 243-263.
- Daniel, Kent, David Hirshleifer, and Avanidhar Subrahmanaym, 1998. Investor psychology and security market under- and overreactions, *Journal of Finance* 53, 1839-1885.
- De Bondt, Werner F. M., 1998. A portrait of the individual investor. *European Economic Review* 42, 831-844.
- Denrell, Jerker, 2005. Why most people disapprove of me: Experience sampling in impression formation, *Psychological Review* 112, 951-978.
- Denrell, Jerker, 2007. Adaptive learning and risk taking, *Psychological Review* 114, 177-187.
- Denrell, Jerker, and James G. March, 2001. Adaptation as information restriction: The hot stove effect, *Organization Science* 12, 523-538.
- Erev, Ido, and Greg Barron, 2005. On adaptation, maximization, and reinforcement learning among cognitive strategies, *Psychological Review* 112, 912-931.

- Feldman, Robert S., and Alice G. Bernstein, 1978. Primacy effects in self-attribution of ability, *Journal of Personality* 46, 732-742.
- Frieder, Laura. and Avanidhar Subrahmanyam, 2005. Brand perceptions and the market for common stock, *Journal of Financial and Quantitative Analysis* 40, 57-85.
- Furnham, Adrian, 1986. The robustness of the recency effect: Studies using legal evidence. *Journal of General Psychology* 113, 351-357.
- Gervais, Simon, and Terrance Odean, 2001. Learning to be overconfident, *Review of Financial Studies* 14, 1-27.
- Grinblatt, Mark, and Matti Keloharju, 2000. The investment behavior and performance of various investor types: A study of Finland's unique data set, *Journal of Financial Economics* 55, 43-67.
- Grinblatt, Mark, and Matti Keloharju, 2001a. How distance, language, and culture influence stockholdings and trades, *Journal of Finance* 56, 1053-1073.
- Grinblatt, Mark, and Matti Keloharju, 2001b. What makes investors trade? *Journal of Finance* 56, 589-616.
- Grinblatt, Mark, and Matti Keloharju, 2004. Tax-loss trading and wash sales. *Journal of Financial Economics* 71, 51-76.
- Gruber, Martin J., 1996. Another puzzle: The growth in actively managed mutual funds. *Journal of Finance* 51, 783-810.
- Hartzmark, Samuel M., 2015. The worst, the best, ignoring all the rest: the rank effect and trading behavior, *Review of Financial Studies* 28, 1024-1059.
- Heckman, James J., 1976. The common structure of statistical models of truncation, sample selection, and dependent variables and a simple estimator for such models, *Annals of Economic and Social Measurement* 5, 475-492.
- Hertwig, Ralph, Greg Barron, Elke U. Weber, and Ido Erev, 2006. Rare risky prospects: Different when valued through a window of sampled experiences, in Klaus Fiedler and Patrik Juslin (eds), *Information Sampling as a Key to Understanding Adaptive Cognition in an Uncertain Environment*, (Cambridge University Press, Cambridge, UK), 72-91.

- Hogarth, Robin M., and Hillel J. Einhorn, 1992. Order effects in belief updating: The belief-adjustment model, *Cognitive Psychology* 24, 1-55.
- Jones, Edward E., Leslie Rock, Kelly G. Shaver, George R. Goethals, and Lawrence M. Ward, 1968. Pattern of performance and ability attribution: An unexpected primacy effect, *Journal of Personality and Social Psychology* 10, 317-340.
- Kahneman, Daniel, and Amos Tversky, 1979. Prospect theory: An analysis of decision under risk, *Econometrica* 47, 263-292.
- Kaustia, Markku, and Samuli Knüpfer, 2008. Do investors overweight personal experience? Evidence from IPO subscriptions, *Journal of Finance* 63, 2679-2702.
- Kaustia, Markku, and Samuli Knüpfer, 2012. Peer performance and stock market entry, *Journal of Financial Economics* 104, 321-338.
- Kumar, Alok, 2009. Who gambles in the stock market? *Journal of Finance* 64, 1889-1933.
- Linnainmaa, Juhani T., 2011. Why do (some) households trade so much? *The Review of Financial Studies* 24, 1630-1666.
- Luce, R. Duncan, 1959. *Individual Choice Behavior: A Theoretical Analysis*, (Wiley, New York, NY).
- Malkiel, Burton G. 2013. Asset management fees and the growth of finance. *Journal of Economic Perspectives* 27, 97-108.
- Malmendier, Ulrike, and Stefan Nagel, 2011. Depression babies: Do macroeconomic experiences affect risk-taking? *Quarterly Journal of Economics* 126, 373-416.
- Neyman, J., Elizabeth L. Scott, 1948. Consistent estimates based on partially consistent observations. *Econometrica* 16, 1-32.
- Nisbett, Richard E., and Lee Ross, 1980. *Human Inference: Strategies and Shortcomings of Social Judgment*, (Prentice-Hall, Englewood Cliffs, NJ).
- Nofsinger, John R., and Abhishek Varma, 2013. Availability, recency, and sophistication in the repurchasing behavior of retail investors, *Journal of Banking & Finance* 37, 2572-2585.

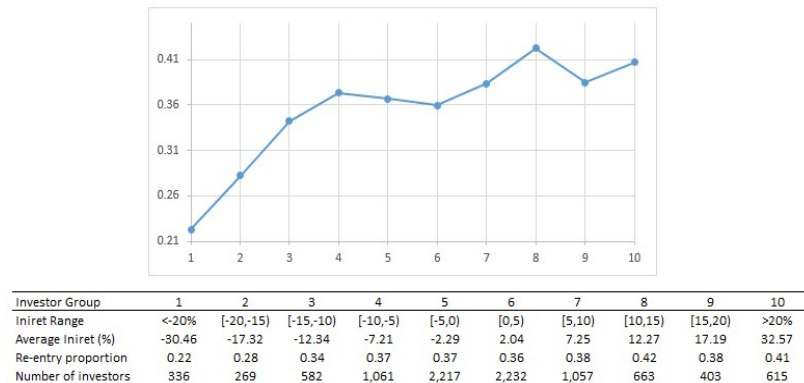
- Odean, Terrance, 1998. Are investors reluctant to realize their losses?, *Journal of Finance* 53, 1775-1798.
- The Economist. 2012. The Nokia effect. The Economist Group Limited.
- Pinsker, Robert, 2011. Primacy or recency? A study of order effects when nonprofessional investors are provided a long series of disclosures, *Behavioural Research in Accounting* 23, 161-183.
- Plonsky, Ori, Kinneret Teodorescu, and Ido Erev, 2015. Reliance on small samples, the wavy recency effect, and similarity-based learning, *Psychological Review* 122, 621-647.
- Samuelson, William and Richard J. Zeckhauser, 1988. Status Quo Bias in Decision Making, *Journal of Risk and Uncertainty* 18, 7-59.
- Seru, Amit, Tyler Shumway, and Noah Stoffman, 2010. Learning by trading, *Review of Financial Studies* 23, 705-739.
- Shefrin, Hersh, and Meir Statman, 1985. The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance* 40, 777-790.
- Stambaugh, Robert F., 2014. Presidential address: Investment noise and trends. *Journal of Finance* 69, 1415-1453.
- Strahilevitz, Michal Ann, Terrance Odean, and Brad M. Barber, 2011. Once burned, twice shy: How naive learning, counterfactuals, and regret affect the repurchase of stocks previously sold, *Journal of Marketing Research* 48, 102-120.
- Tuttle, Brad, Maribeth Collier, and F. Greg Burton, 1997. An examination of market efficiency: Information order effects in a laboratory market, *Accounting, Organizations and Society* 22, 89-103.
- Tversky, Amos, and Daniel Kahneman, 1974. Judgment under uncertainty: Heuristics and biases, *Science* 185, 1124-1131.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie. 2011. Financial literacy and stock market participation. *Journal of Financial Economics*. 101(2):449-472.



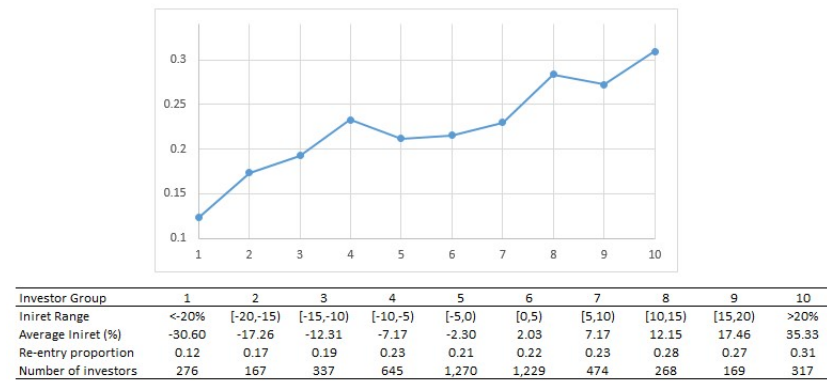
Yechiam, Eldad, and Jerome R. Busemeyer, 2005. Comparison of basic assumptions embedded in learning models for experience-based decision making, *Psychonomic Bulletin and Review* 12, 387-402.

Figure 1

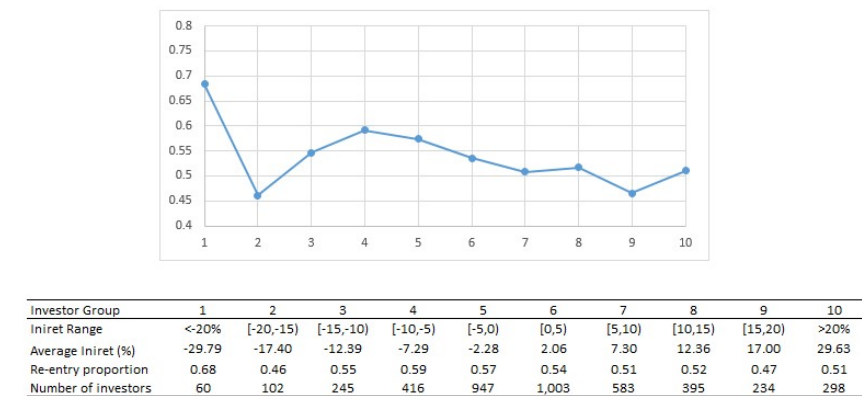
## Proportion of re-entering investors



(a) All investors



(b) Non-Nokia investors



(c) Nokia investors

Figure (a) plots the proportion of investors who return to the stock market after withdrawal from it for all investors in our sample, and Figures (b) and (c) separately for non-Nokia and Nokia investors respectively. The y-axis represents the proportion, and the x-axis represents investor deciles sorted by their initial returns. The proportion is computed as the number of re-entering investors divided by the total number of investors within each decile. Average returns and the number of investors in each decile are also presented.

Table 1

**Summary statistics**

Panel A reports descriptive statistics at the account level for all investors in our database as well as the primary sample used for our main analyses. Panel B presents summary statistics for the panel data of our primary sample about all explanatory variables used in our main regressions. Panel C presents the correlation matrix for the main explanatory variables with the statistically significant (at the 1% level) numbers in gray. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing.  $I(IniRet < 0)$  is a dummy variable that equals 1 if *IniRet* < 0, and 0 otherwise. Likewise,  $I(IniRet \geq 0)$  is a dummy variable that equals 1 if *IniRet*  $\geq 0$ . *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *Vicinity* is a dummy variable that equals 1 if an investor resides in the same municipality where the company's headquarters is located. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchases and exiting the market, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of sample. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Old* is a dummy variable that equals 1 if investor is older than 50. *InvSiz\_H* is a dummy variable that equals 1 if *InvSiz* is greater than the sample median. *Helsinki* is a dummy variable that equals 1 if an investor resides in Helsinki. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). *DurAway* is a discrete time variable defined as the number of months for which the investor is absent from the stock market. *IVol* and *ISkew* are the initial stock's idiosyncratic volatility and skewness, respectively. Stock market returns a month before-, on-, after the entry month is *Mkt\_bf*, *Mkt\_entry*, and *Mkt\_af*, respectively. *Ret\_entry* is the past 3-month return of the initial stock, and *Value* is the indicator of the initial stock being a value stock (i.e., the book-to-market ratio is higher than the sample median). *Option* is a dummy variable that equals to 1 if an investor ever traded an option during our sample period. There are 276,470 investor-months (9,435 investors) in our primary sample.

Panel A. Investor-level data

Variable	All Investors (N=94,755)			Our Sample (N=9,435)		
	Mean	Std Dev	Skewness	Mean	Std Dev	Skewness
<b>Demographics</b>						
Age	38.44	17.95	-0.10	38.61	16.07	0.33
Female = 1	0.34	0.47	0.67	0.28	0.45	0.96
Helsinki=1	0.25	0.43	1.15	0.25	0.43	1.12
WelthyZip=1	0.34	0.47	0.64	0.34	0.47	0.66
<b>Investment during the entire sample period (January 1995 to December 2003)</b>						
Number of stocks traded	2.7	3.1	4.12	2.33	2.71	4.24
Number of trades	7.57	18.16	18.73	9.19	19.18	14.53
Number of years with trades	1.82	1.07	1.52	2.21	1.14	1.57
Average EUR value of trades (log)	3.37	3.61	1.09	3.45	3.73	1.02
Option trade = 1	0.01	0.10	9.26	0.01	0.11	8.64
Inheritance = 1	0.01	0.11	8.31	0.01	0.08	11.10
<b>Initial investment</b>						
Entry year	2,000.04	1.47	-0.62	1,999.34	1.82	-0.49
Number of stock purchased	0.80	0.39	-1.51	0.87	0.32	-2.31
Nokia = 1	0.27	0.44	1.03	0.30	0.46	0.83
Average EUR value of trades (log)	7.56	1.33	-0.34	7.55	1.34	-0.35

Panel B. Panel data of our sample (N = 276,470 Investor-Months)

Variable	Mean	Std Dev	5th Pctl	50th Pctl	95th Pctl
IniRet	0.0120	0.1266	-0.1630	0.0005	0.2131
IniRet $\times$ I(IniRet $\geq$ 0)	0.0473	0.0907	0.0000	0.0005	0.2131
IniRet $\times$ I(IniRet < 0)	-0.0353	0.0667	-0.1630	0.0000	0.0000
AllRet	0.0442	0.7517	-0.0727	0.0285	0.1561
RecRet	0.0656	1.5015	-0.1504	0.0307	0.2610
RealRet	0.0628	0.7889	-0.0890	0.0202	0.2567
Saliency	6.1671	77.4054	0.1429	1.4981	15.3098
Vicinity	0.2144	0.6373	0.0000	0.0000	1.0000
InvSiz	7.6276	1.3434	5.1487	7.6812	9.6860
SglStock	0.7187	0.4497	0.0000	1.0000	1.0000
ZeroTrd	0.7530	0.4313	0.0000	1.0000	1.0000
Nokia	0.3736	0.4838	0.0000	0.0000	1.0000
MktRet	0.0024	0.1090	-0.1669	-0.0085	0.2244
MktVol	0.1099	0.0388	0.0577	0.1058	0.1817
Female	0.3020	0.4591	0.0000	0.0000	1.0000
Age	38.0566	15.9668	16.0000	36.0000	67.0000
Helsinki	0.2720	0.4450	0.0000	0.0000	1.0000
Option	0.0048	0.0695	0.0000	0.0000	0.0000
Burst	0.8071	0.3946	0.0000	1.0000	1.0000
DurAway	23.1579	18.1314	2.0000	19.0000	60.0000
IVol	0.0282	0.0615	0.0066	0.0198	0.0619
ISkew	0.3039	1.0601	-1.0677	0.1645	1.8509
Mkt_bf	0.0263	0.1044	-0.1669	0.0283	0.1720
Mkt_entry	0.0185	0.0940	-0.1502	0.0235	0.1483
Mkt_af	0.0209	0.0952	-0.1182	0.0235	0.2244
Ret_entry	0.0834	0.3819	-0.4890	0.0344	1.0000
Value	0.2265	0.4086	0.0000	0.0000	1.0000
Minor	0.0520	0.2221	0.0000	0.0000	1.0000
Old	0.2219	0.4156	0.0000	0.0000	1.0000
InvSize_H	0.5003	0.5000	0.0000	1.0000	1.0000
SglStock $\times$ ZeroTrd	0.6286	0.4832	0.0000	1.0000	1.0000
IniRet $\times$ Helsinki	0.0016	0.0640	-0.0667	0.0000	0.0798
IniRet $\times$ Nokia	0.0110	0.0690	-0.0690	0.0000	0.1453
IniRet $\times$ Female	0.0041	0.0653	-0.0671	0.0000	0.0975
IniRet $\times$ SglStock	0.0089	0.1115	-0.1444	0.0000	0.1848
IniRet $\times$ Minor	0.0008	0.0262	0.0000	0.0000	0.0000
IniRet $\times$ Old	0.0025	0.0576	-0.0500	0.0000	0.0677
IniRet $\times$ InvSize_H	0.0086	0.0796	-0.0959	0.0000	0.1470

Panel C. Correlation Matrix for Main Variables

Variable	IniRet	AllRet	InvSiz	SglStock	ZeroTrd	Nokia	MktRet	MktVol	Female	Age	Burst
IniRet	1.0000										
AllRet	0.0429	1.0000									
InvSiz	0.0617	0.013	1.0000								
SglStock	0.0039	0.0142	-0.1264	1.0000							
ZeroTrd	0.0040	0.0164	-0.1235	0.4511	1.0000						
Nokia	0.1065	0.0259	0.2613	-0.1741	-0.0564	1.0000					
MktRet	0.0023	-0.0005	0.0242	-0.0264	0.0131	0.0257	1.0000				
MktVol	0.0090	0.0077	0.0054	0.0020	0.0128	-0.0138	-0.1187	1.0000			
Female	0.0086	0.0243	0.0461	0.1088	0.0741	0.0098	0.0005	0.0056	1.0000		
Age	-0.0053	-0.0008	0.2813	0.0136	0.0129	0.0707	0.0044	-0.0105	0.1496	1.0000	
Burst	-0.0282	-0.0006	-0.1142	0.1218	-0.0669	-0.0972	-0.2841	0.2624	0.0058	-0.0166	1.0000

Table 2

**Initial returns and the likelihood of re-entry**

The estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\text{Logit}(\text{Re-entry}_{i,t}) = \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{DurAway}_{i,t} + \beta_3 \text{Controls}_{i,t} \\ + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and 0 otherwise. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *DurAway* measures the length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* is accounted for by controlling for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) of the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.6706*** (3.67)	1.6358*** (3.51)	1.6758*** (3.75)	1.4398** (2.51)
InvSiz		1.2319*** (5.28)	1.2127*** (4.48)	1.1712*** (3.69)
SglStock			0.2869*** (-12.24)	0.3069*** (-11.62)
ZeroTrd			2.8545*** (21.64)	2.7426*** (20.70)
SglStock $\times$ ZeroTrd			0.2539*** (-12.01)	0.2699*** (-11.52)
Nokia				1.9982*** (17.39)
MktRet	0.4707*** (-4.45)	0.4716*** (-4.44)	0.4359*** (-4.81)	0.4228*** (-4.98)
MktVol	0.4722 (-1.19)	0.4706 (-1.19)	0.4108 (-1.36)	0.3986 (-1.40)
Female	0.7408*** (-7.06)	0.7421*** (-7.01)	0.9254* (-1.79)	0.9180** (-1.97)
Age	0.9993 (-0.58)	0.9990 (-0.84)	1.0007 (0.50)	1.0001 (0.09)
Burst	0.4590*** (-10.95)	0.4590*** (-10.95)	0.5378*** (-8.43)	0.5507*** (-8.01)
DurAway	0.9470*** (-24.97)	0.9469*** (-25.01)	0.9559*** (-23.15)	0.9568*** (-23.19)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,746.48***	1,768.49***	5,221.45***	5,795.08***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1697	0.1806

Table 3

**Beyond initial returns: Average returns**

The estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\text{Logit}(\text{Re-entry}_{i,t}) = \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{DurAway}_{i,t} + \beta_4 \text{Controls}_{i,t} \\ + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit. *DurAway* is the time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.6687*** (3.66)	1.6342*** (3.50)	1.6653*** (3.70)	1.4345** (2.49)
AllRet	1.0047 (0.26)	1.0037 (0.21)	1.0209 (1.19)	1.0129 (0.73)
InvSiz		1.2318*** (5.28)	1.2123*** (4.47)	1.1710*** (3.68)
SglStock			0.2869*** (-12.25)	0.3069*** (-11.62)
ZeroTrd			2.8535*** (21.64)	2.7421*** (20.69)
SglStock $\times$ ZeroTrd			0.2537*** (-12.01)	0.2697*** (-11.52)
Nokia				1.9975*** (17.38)
MktRet	0.4708*** (-4.45)	0.4716*** (-4.44)	0.4360*** (-4.81)	0.4229*** (-4.98)
MktVol	0.4720 (-1.19)	0.4705 (-1.19)	0.4105 (-1.37)	0.3984 (-1.40)
Female	0.7406*** (-7.06)	0.7419*** (-7.01)	0.9245* (-1.81)	0.9174** (-1.98)
Age	0.9993 (-0.58)	0.9990 (-0.83)	1.0007 (0.51)	1.0001 (0.09)
Burst	0.4590*** (-10.95)	0.4590*** (-10.95)	0.5379*** (-8.43)	0.5507*** (-8.00)
DurAway	0.9470*** (-24.97)	0.9469*** (-25.01)	0.9559*** (-23.15)	0.9568*** (-23.19)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,746.38***	1,768.82***	5,222.07***	5,718.72***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1698	0.1782



Table 4

**Beyond initial returns: Recent returns**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{RecRet}_i + \beta_4 \text{DurAway}_{i,t} + \beta_5 \text{Controls}_{i,t} \\ & + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t} \end{aligned}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, and *RecRet* is the return in the last month of investing. *DurAway* is length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.6521*** (3.30)	1.6332*** (3.22)	1.7110*** (3.67)	1.4768** (2.51)
AllRet	1.0489 (0.17)	1.0065 (0.02)	0.9224 (-0.49)	0.9005 (-0.49)
RecRet	0.9786 (-0.16)	0.9986 (-0.01)	1.0527 (0.62)	1.0611 (0.55)
InvSiz		1.2318*** (5.26)	1.2137*** (4.49)	1.1726*** (3.70)
SglStock			0.2867*** (-12.25)	0.3067*** (-11.63)
ZeroTrd			2.8544*** (21.65)	2.7426*** (20.70)
SglStock $\times$ ZeroTrd			0.2538*** (-12.01)	0.2698*** (-11.52)
Nokia				1.9976*** (17.38)
MktRet	0.4712*** (-4.44)	0.4716*** (-4.44)	0.4350*** (-4.82)	0.4217*** (-4.99)
MktVol	0.4713 (-1.19)	0.4704 (-1.19)	0.4119 (-1.36)	0.4000 (-1.40)
Female	0.7404*** (-7.06)	0.7419*** (-7.01)	0.9255* (-1.78)	0.9183** (-1.96)
Age	0.9993 (-0.58)	0.9990 (-0.83)	1.0006 (0.50)	1.0001 (0.07)
Burst	0.4591*** (-10.94)	0.4590*** (-10.94)	0.5377*** (-8.43)	0.5505*** (-8.01)
DurAway	0.9470*** (-24.97)	0.9469*** (-25.01)	0.9559*** (-23.14)	0.9568*** (-23.19)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,749.49***	1,771.12***	5,224.11***	5,720.54***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1698	0.1782

Table 5

**Beyond initial returns: Realized returns**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\text{Logit}(\text{Re-entry}_{i,t}) = \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{RecRet}_i + \beta_4 \text{RealRet}_i + \beta_5 \text{DurAway}_{i,t} + \beta_6 \text{Controls}_{i,t} \\ + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *DurAway* is length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.6234*** (3.17)	1.6033*** (3.08)	1.6552*** (3.42)	1.4357** (2.32)
AllRet	1.0248 (0.09)	0.9819 (-0.06)	0.9006 (-0.59)	0.8780 (-0.57)
RecRet	0.9897 (-0.07)	1.0107 (0.07)	1.0650 (0.71)	1.0743 (0.63)
RealRet	1.0436* (1.73)	1.0452* (1.80)	1.0754*** (3.17)	1.0673*** (2.77)
InvSiz		1.2329*** (5.29)	1.2161*** (4.53)	1.1751*** (3.75)
SglStock			0.2865*** (-12.26)	0.3065*** (-11.63)
ZeroTrd			2.8450*** (21.59)	2.7359*** (20.66)
SglStock $\times$ ZeroTrd			0.2533*** (-12.02)	0.2692*** (-11.54)
Nokia				1.9965*** (17.37)
MktRet	0.4711*** (-4.45)	0.4716*** (-4.44)	0.4349*** (-4.83)	0.4215*** (-5.00)
MktVol	0.4710 (-1.19)	0.4702 (-1.20)	0.4113 (-1.36)	0.3997 (-1.40)
Female	0.7388*** (-7.11)	0.7402*** (-7.06)	0.9226* (-1.85)	0.9150** (-2.04)
Age	0.9993 (-0.59)	0.9990 (-0.84)	1.0007 (0.51)	1.0001 (0.08)
Burst	0.4594*** (-10.93)	0.4594*** (-10.93)	0.5387*** (-8.41)	0.5517*** (-7.98)
DurAway	0.9470*** (-24.99)	0.9469*** (-25.03)	0.9558*** (-23.17)	0.9568*** (-23.23)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,749.49***	1,771.12***	5,224.11***	5,720.54***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1698	0.1782

Table 6

**Primacy vs. Salience**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\text{Logit}(\text{Re-entry}_{i,t}) = \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{RecRet}_i + \beta_4 \text{RealRet}_i + \beta_5 \text{Saliency}_i + \beta_6 \text{DurAway}_{i,t} + \beta_7 \text{Controls}_{i,t} \\ + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *DurAway* is length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.6255*** (3.18)	1.6054*** (3.09)	1.6579*** (3.43)	1.4376** (2.33)
AllRet	1.0272 (0.09)	0.9840 (-0.06)	0.9012 (-0.59)	0.8795 (-0.56)
RecRet	0.9886 (-0.08)	1.0096 (0.07)	1.0646 (0.71)	1.0733 (0.62)
RealRet	1.0436* (1.73)	1.0452* (1.80)	1.0754*** (3.17)	1.0673*** (2.77)
Saliency	1.0001*** (3.86)	1.0001*** (3.70)	1.0001*** (3.62)	1.0001*** (5.17)
InvSiz		1.2328*** (5.28)	1.2163*** (4.53)	1.1752*** (3.75)
SglStock			0.2868*** (-12.24)	0.3069*** (-11.62)
ZeroTrd			2.8480*** (21.58)	2.7394*** (20.67)
SglStock $\times$ ZeroTrd			0.2525*** (-12.05)	0.2684*** (-11.56)
Nokia				1.9994*** (17.39)
MktRet	0.4688*** (-4.47)	0.4693*** (-4.47)	0.4326*** (-4.85)	0.4193*** (-5.03)
MktVol	0.4673 (-1.21)	0.4665 (-1.21)	0.4077 (-1.38)	0.3960 (-1.41)
Female	0.7393*** (-7.09)	0.7407*** (-7.04)	0.9235* (-1.83)	0.9160** (-2.02)
Age	0.9993 (-0.60)	0.9990 (-0.86)	1.0006 (0.50)	1.0001 (0.05)
Burst	0.4591*** (-10.94)	0.4591*** (-10.94)	0.5385*** (-8.42)	0.5514*** (-7.99)
DurAway	0.9470*** (-24.96)	0.9469*** (-25.01)	0.9559*** (-23.14)	0.9568*** (-23.20)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,749.49***	1,771.12***	5,224.11***	5,720.54***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1698	0.1782

Table 7

**Sensitivity of re-entry: Losses versus gains**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i \times I(\text{IniRet}_i \geq 0) + \beta_2 \text{IniRet}_i \times I(\text{IniRet}_i < 0) \\ & + \beta_3 \text{AllRet}_i + \beta_4 \text{RecRet}_i + \beta_5 \text{RealRet}_i + \beta_6 \text{Saliency}_i + \beta_7 \text{DurAway}_{i,t} + \beta_8 \text{Controls}_{i,t} \\ & + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t} \end{aligned}$$

*Re-entry* equals 1 if investor  $i$  re-enters the market in month  $t$  by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing.  $I(\text{IniRet} < 0)$  is a dummy variable that equals 1 if  $\text{IniRet} < 0$ , and 0 otherwise. Likewise,  $I(\text{IniRet} \geq 0)$  is a dummy variable that equals 1 if  $\text{IniRet} \geq 0$ , and 0 otherwise. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *DurAway* is the length of time (in unit of months) for which an investor is away from the stock market, i.e., time between exit month and month  $t$ . We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables for the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet $\times$ I(IniRet $\geq$ 0)	1.6068** (2.32)	1.5832** (2.24)	1.9149*** (3.36)	1.8187*** (2.92)
IniRet $\times$ I(IniRet < 0)	1.6653* (1.65)	1.6530 (1.62)	1.2334 (0.71)	0.9036 (-0.34)
AllRet	1.0287 (0.10)	0.9858 (-0.05)	0.8856 (-0.69)	0.8562 (-0.69)
RecRet	0.9878 (-0.09)	1.0087 (0.06)	1.0739 (0.80)	1.0878 (0.74)
RealRet	1.0436* (1.74)	1.0452* (1.80)	1.0754*** (3.18)	1.0675*** (2.78)
Saliency	1.0001*** (3.87)	1.0001*** (3.72)	1.0001*** (3.49)	1.0001*** (4.98)
InvSiz		1.2328*** (5.28)	1.2166*** (4.54)	1.1756*** (3.76)
SglStock			0.2865*** (-12.25)	0.3068*** (-11.62)
ZeroTrd			2.8426*** (21.54)	2.7313*** (20.60)
SglStock $\times$ ZeroTrd			0.2526*** (-12.04)	0.2684*** (-11.56)
Nokia				2.0040*** (17.43)
MktRet	0.4688*** (-4.47)	0.4693*** (-4.47)	0.4326*** (-4.85)	0.4193*** (-5.03)
MktVol	0.4671 (-1.21)	0.4662 (-1.21)	0.4107 (-1.37)	0.4010 (-1.39)
Female	0.7392*** (-7.09)	0.7406*** (-7.04)	0.9243* (-1.81)	0.9170** (-1.99)
Age	0.9993 (-0.60)	0.9990 (-0.86)	1.0007 (0.51)	1.0001 (0.07)
Burst	0.4592*** (-10.93)	0.4592*** (-10.92)	0.5371*** (-8.44)	0.5493*** (-8.03)
DurAway	0.9470*** (-24.94)	0.9469*** (-24.99)	0.9560*** (-22.97)	0.9570*** (-22.99)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,747.95***	1,770.08***	5,238.49***	5,743.82***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1698	0.1783



Table 8

**Initial returns and re-entry by investor type**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{IniRet}_i \times \text{InvTyp}_i + \beta_3 \text{InvTyp}_i + \beta_5 \text{AllRet}_i + \beta_6 \text{RecRet}_i \\ & + \beta_7 \text{RealRet}_i + \beta_8 \text{Saliency}_i + \beta_9 \text{DurAway}_{i,t} + \beta_{10} \text{Controls}_{i,t} + (\text{investment size fixed effect}) \\ & + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t} \end{aligned}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *InvTyp* includes three variables: *SglStock*, *Nokia*, and *Minor*. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *DurAway* is the length of time (in unit of months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable that equals 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) of the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Old* is a dummy variable that equals 1 if investor is older than 50. *InvSiz\_H* is a dummy variable that equals 1 if *InvSiz* is greater than the sample median. *Helsinki* is a dummy variable that equals 1 if an investor resides in Helsinki. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
VARIABLES	Re-entry						
IniRet	1.2197 (1.12)	2.5190*** (4.56)	1.5455*** (2.73)	1.4654* (1.90)	1.3552* (1.77)	1.4243** (2.22)	1.5591** (2.48)
IniRet × SglStock	1.8943* (1.92)						
IniRet × Nokia		0.3736*** (-3.52)					
IniRet × Minor			0.1756** (-2.42)				
IniRet × InvSize_H				0.9647 (-0.13)			
IniRet × Female					1.3131 (0.77)		
IniRet × Old						1.1210 (0.18)	
IniRet × Helsinki							0.7291 (-0.98)
SglStock	0.3025*** (-11.69)						
Nokia		2.0407*** (17.74)					
Minor			1.4466*** (3.93)				
InvSize_H				0.9708 (-0.34)			
Female					0.9103** (-2.13)		
Old						1.0229 (0.27)	
Helsinki							1.0205 (0.06)
Investment size quintile dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model fit	5,705.27***	5,756.70***	5,736.72***	6,283.31***	6,236.26***	6,236.39***	6,245.06***
Pseudo R <sup>2</sup>	0.1783	0.1786	0.1787	0.1887	0.1887	0.1887	0.1887

Table 9

**Employee stock-ownership plans**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{RecRet}_i + \beta_4 \text{RealRet}_i + \beta_5 \text{Saliency}_i + \beta_6 \text{Vicinity}_i \\ & + \beta_7 \text{DurAway}_{i,t} + \beta_8 \text{Controls}_{i,t} + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) \\ & + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t} \end{aligned}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *Vicinity* is a dummy variable that equals 1 if an investor resides in the same municipality where the company's headquarters is located. *DurAway* is length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.6411*** (3.33)	1.6108*** (3.19)	1.6593*** (3.44)	1.4321** (2.31)
AllRet	1.0704 (0.28)	1.0296 (0.12)	0.9358 (-0.40)	0.9302 (-0.35)
RecRet	0.9683 (-0.26)	0.9870 (-0.10)	1.0442 (0.52)	1.0437 (0.41)
RealRet	1.0408 (1.64)	1.0423* (1.70)	1.0732*** (3.08)	1.0671*** (2.77)
Saliency	1.0001*** (6.06)	1.0001*** (5.94)	1.0001*** (5.46)	1.0001*** (8.39)
Vicinity	1.2883*** (8.65)	1.2925*** (9.13)	1.1640*** (8.83)	1.1512*** (8.26)
InvSiz		1.2359*** (5.30)	1.2193*** (4.59)	1.1804*** (3.84)
SglStock			0.3114*** (-11.33)	0.3253*** (-10.94)
ZeroTrd			2.8302*** (21.68)	2.7359*** (20.87)
SglStock $\times$ ZeroTrd			0.2661*** (-11.50)	0.2810*** (-11.07)
Nokia				1.9102*** (16.47)
MktRet	0.4610*** (-4.55)	0.4614*** (-4.55)	0.4337*** (-4.84)	0.4215*** (-5.00)
MktVol	0.5157 (-1.04)	0.5138 (-1.05)	0.4141 (-1.35)	0.3966 (-1.41)
Female	0.7678*** (-6.02)	0.7709*** (-5.96)	0.9429 (-1.36)	0.9340 (-1.57)
Age	0.9998 (-0.13)	0.9995 (-0.39)	1.0006 (0.43)	1.0001 (0.06)
Burst	0.4416*** (-11.47)	0.4416*** (-11.47)	0.5284*** (-8.66)	0.5418*** (-8.22)
DurAway	0.9510*** (-23.12)	0.9509*** (-23.19)	0.9569*** (-22.86)	0.9574*** (-23.05)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,749.49***	1,771.12***	5,224.11***	5,720.54***
Pseudo R <sup>2</sup>	0.0749	0.0757	0.1698	0.1782

**Appendix for**  
**“Primacy in Stock Market Participation:**  
**The Effect of Initial Returns on Market Re-Entry Decisions”**  
(Not for Publication)

Ozlem Arikan      Arie E. Gozluklu      Gi H. Kim      Hiroaki Sakaguchi

March 2018

This appendix furnishes supplementary results for Arikan, Gozluklu, Kim, and Sakaguchi to appear at the *European Journal of Finance*.

Table A.1

**Sample Selection into market entry**

$$\begin{aligned}
\text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_i + \beta_3 \text{RecRet}_i + \beta_4 \text{RealRet}_i + \beta_5 \text{Saliency}_i + \beta_6 \text{Vicinity}_i + \beta_7 \text{IVol}_i \\
& + \beta_8 \text{ISkew}_i + \beta_9 \text{Mkt\_bf}_i + \beta_{10} \text{Mkt\_entry}_i + \beta_{11} \text{Mkt\_af}_i + \beta_{12} \text{DurAway}_{i,t} + \beta_{13} \text{Controls}_{i,t} \\
& + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t}
\end{aligned}$$

*Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *Vicinity* is a dummy variable that equals 1 if an investor resides in the same municipality where the company's headquarters are located. *DurAway* is length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit; *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *IVol* and *ISkew* are the initial stock's idiosyncratic volatility and skewness, respectively. Stock market returns a month before-, on-, after the entry month is *Mkt\_bf*, *Mkt\_entry*, and *Mkt\_af*, respectively. *Ret\_entry* is the past 3-month return of the initial stock, and *Value* is the indicator of the initial stock being a value stock (i.e., the book-to-market ratio is higher than the sample median). *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. Other controls include the following variables; *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) on the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	1.7003*** (2.92)	1.6818*** (2.85)	1.7899*** (3.16)	1.5218** (2.22)
AllRet	1.5219*** (3.75)	1.4583*** (3.28)	1.4483*** (3.45)	1.3264*** (2.65)
RecRet	0.8100*** (-3.71)	0.8273*** (-3.26)	0.8376*** (-3.24)	0.8734** (-2.50)
RealRet	1.0326 (1.22)	1.0340 (1.28)	1.0651** (2.51)	1.0581** (2.25)
Saliency	1.0001*** (4.32)	1.0001*** (4.12)	1.0001*** (4.26)	1.0001*** (5.49)
Vicinity	1.2782*** (5.89)	1.2827*** (6.16)	1.1657*** (6.10)	1.1428*** (5.55)
IVol	0.0593** (-2.20)	0.0668** (-2.09)	0.0000*** (-5.72)	0.0058*** (-2.79)
ISkew	1.0159 (0.69)	1.0187 (0.81)	1.0186 (0.73)	1.0214 (0.89)
Mkt_bf	0.5566*** (-2.60)	0.5654** (-2.52)	0.6123** (-2.14)	0.7001 (-1.55)
Mkt_entry	0.4972*** (-2.75)	0.4915*** (-2.79)	0.3837*** (-3.75)	0.4716*** (-2.95)
Mkt_af	1.3229 (1.29)	1.3102 (1.25)	0.8237 (-0.90)	0.8755 (-0.62)
Ret_entry	0.8062*** (-3.07)	0.8022*** (-3.13)	0.7074*** (-4.71)	0.6938*** (-5.01)
Value	0.8452*** (-3.12)	0.8568*** (-2.86)	0.7654*** (-5.21)	0.9457 (-1.02)
InvSiz		1.2046*** (4.16)	1.2060*** (3.94)	1.1867*** (3.62)
SglStock			0.3003*** (-11.12)	0.3283*** (-10.20)
ZeroTrd			2.5416*** (17.97)	2.5094*** (17.76)
SglStock $\times$ ZeroTrd			0.2925*** (-10.23)	0.2973*** (-10.11)
Nokia				1.7771*** (11.07)
Other controls	Yes	Yes	Yes	Yes
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	1,667.57***	1,675.63***	4,415.84***	4,564.85***
Pseudo R <sup>2</sup>	0.0832	0.0838	0.1636	0.1681

Table A.2

**Heckman (1976) correction model: First-stage regression of exit**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\begin{aligned} \text{Logit}(\text{Exit}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i + \beta_2 \text{AllRet}_{i,t} + \beta_3 \text{RecRet}_{i,t} + \beta_4 \text{DurInv}_{i,t} + \beta_5 \text{Controls}_{i,t} \\ & + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{entry month fixed effect}) + \epsilon_{i,t} \end{aligned}$$

*Exit* equals 1 if investor *i* exits the market in month *t* by closing out, and otherwise is 0. *IniRet*, the main (time-invariant) explanatory variable of interest, is the return in the first month of investing. *AllRet* is the time-varying variable, i.e., the lagged value of the average return of all months, and *RecRet* is the time-varying variable, i.e., the return in the last (i.e., previous) month to the month for which an investor decides to exit, computed using lagged monthly return. *DurInv* is the length of time (in months) for which an investor participates in the stock market. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Entry month fixed effect* controls for 105 dummy variables indicating the calendar month of entry. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) of the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 3,376,258 investor-months (94,755 investors) in the sample.



VARIABLES	Model 1	Model 2	Model 3	Model 4
	Re-entry			
IniRet	0.9983*** (-3.45)	0.5304*** (-9.59)	0.4878*** (-10.04)	0.4363*** (-12.19)
AllRet			1.152461397 (1.14)	2.2942*** (12.20)
RecRet		1.8873*** (9.60)	1.7805*** (5.65)	
Inherit	0.6007*** (-4.11)	0.6045*** (-4.06)	0.6050*** (-4.06)	0.6052*** (-4.05)
InvSiz	0.9545*** (-4.78)	0.9564*** (-4.56)	0.9554*** (-4.64)	0.9500*** (-5.24)
SglStock	4.4145*** (52.80)	4.4052*** (52.74)	4.4021*** (52.73)	4.3920*** (52.61)
ZeroTrd	0.5181*** (-14.59)	0.5139*** (-14.77)	0.5138*** (-14.77)	0.5153*** (-14.71)
SglStock $\times$ ZeroTrd	0.8014*** (-4.41)	0.8013*** (-4.41)	0.8015*** (-4.40)	0.8028*** (-4.37)
Nokia	1.2010*** (9.22)	1.2203*** (9.93)	1.2226*** (10.05)	1.2249*** (10.16)
MktRet	5.9146*** (21.21)	5.3258*** (10.22)	5.2169*** (9.10)	5.4198*** (19.84)
MktVol	0.2702 (-1.06)	0.2801 (-1.03)	0.2725 (-1.05)	0.2251 (-1.21)
Female	0.6959*** (-19.52)	0.6976*** (-19.38)	0.6978*** (-19.36)	0.6976*** (-19.37)
Age	0.9991** (-2.00)	0.9991* (-1.92)	0.9992* (-1.90)	0.9992* (-1.85)
Burst	0.4076*** (-24.15)	0.4034*** (-24.23)	0.4062*** (-23.64)	0.4214*** (-23.25)
DurInv	0.9382*** (-50.71)	0.9380*** (-50.61)	0.9380*** (-50.66)	0.9380*** (-50.91)
Investment size quintile dummies	Yes	Yes	Yes	Yes
Zip code dummies	Yes	Yes	Yes	Yes
Entry time dummies	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes
Model fit	15,100.91***	15,102.23	15,101.49***	15,133.21***
Pseudo R <sup>2</sup>	0.1044	0.1123	0.1048	0.1177

Table A.3

**Heckman (1976) correction model: Second-stage regression of re-entry**

Estimated coefficients are reported from the following multi-period (monthly) logit regression:

$$\begin{aligned} \text{Logit}(\text{Re-entry}_{i,t}) = & \beta_0 + \beta_1 \text{IniRet}_i \times I(\text{IniRet}_i \geq 0) + \beta_2 \text{IniRet}_i \times I(\text{IniRet}_i < 0) + \beta_3 \text{AllRet}_i + \beta_4 \text{RecRet}_i \\ & + \beta_5 \text{RealRet}_i + \beta_6 \text{Saliency}_i + \beta_7 \text{Vicinity}_i + \beta_8 \text{DurAway}_{i,t} + \beta_9 \text{Controls}_{i,t} + \pi \lambda_i \\ & + (\text{investment size fixed effect}) + (\text{zip-code fixed effect}) + (\text{exit month fixed effect}) + (\text{year fixed effect}) + \epsilon_{i,t} \end{aligned}$$

$\lambda_i$  is the inverse Mill's ratio (i.e., the estimated probability of exit). *Re-entry* equals 1 if investor *i* re-enters the market in month *t* by purchasing any stock at any time after one calendar month of exit, and otherwise is 0. *IniRet*, the main explanatory variable of interest, is the return in the first month of investing.  $I(\text{IniRet} < 0)$  is a dummy variable that equals 1 if *IniRet* < 0, and 0 otherwise. Likewise,  $I(\text{IniRet} \geq 0)$  is a dummy variable that equals 1 if *IniRet* ≥ 0, and 0 otherwise. *AllRet* is the value-weighted average of monthly returns during the entire period of investing between entry and exit, *RecRet* is the return in the last month of investing, and *RealRet* is the realized return during the actual period of investing. *Saliency* is an absolute difference between the initial return and the average return for the duration of investing, divided by the absolute value of average returns. *Vicinity* is a dummy variable that equals 1 if an investor resides in the same municipality where the company's headquarters are located. *DurAway* is the length of time (in months) for which an investor is away from the stock market, i.e., time between exit month and month *t*. We account for the fixed effects of investment size, location of residency, and exit time by including dummies for portfolio holding quintiles, 100 different zip codes, and 105 different exit months, respectively: *Investment size fixed effect* uses five dummy variables indicating quintiles of average portfolio holdings; *Zip-code fixed effect* is based on 100 dummy variables for districts in Finland; and *Exit month fixed effect* controls for 105 dummy variables indicating the calendar month of exit. *Year fixed effect* is accounted for by controlling for 8 year dummy variables indicating the calendar year. *Controls* include the following variables. *InvSiz* is investment size, defined as the log of average portfolio holdings. *ZeroTrd* is a dummy variable that equals 1 if the investor does not trade between initial purchase and market exit, and 0 otherwise. *SglStock* is a dummy variable that equals 1 if the investor only owns one stock. *Nokia* is a dummy variable equal to 1 if an investor initiates investment by purchasing Nokia stock. *Option* is a dummy variable that equals to 1 if an investor ever trades an option during our sample period. *MktRet* and *MktVol* are the monthly return and volatility (standard deviation of daily returns) of the Finnish stock market (OMX Helsinki Index). *Age* is investor age (in years) at the beginning of the sample. *Female* is a dummy variable that equals 1 if investor gender is female. *Minor* is a dummy variable that equals 1 if the account holder is below 16 years of age. *Burst* is a dummy variable, defined as 1 if the time is after the dotcom bubble burst (April 2000). The Wald chi-square of the Wald test for the model fit is reported in the model fit column. Robust standard errors, presented in parentheses, are clustered at the investor level: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. There are 276,470 investor-months (9,435 investors) in the sample.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
VARIABLES	Re-entry						
IniRet	1.6752** (2.32)	1.6858** (2.34)	2.0102*** (2.96)	1.9537*** (3.08)	1.9554*** (3.38)	1.8946*** (3.31)	
IniRet × I(IniRet ≥ 0)							2.5406*** (4.13)
IniRet × I(IniRet < 0)							1.0601 (0.17)
AllRet		0.9833 (-0.23)	0.5646* (-1.80)	0.5542** (-2.19)	0.5552*** (-4.83)	0.5737*** (-7.44)	0.5567*** (-7.67)
RecRet			1.3349* (1.90)	1.3466*** (2.81)	1.3455*** (4.77)	1.3226*** (3.99)	1.3425*** (4.11)
RealRet				1.0646 (1.51)	1.0646 (1.50)	1.0623 (1.32)	1.0624 (1.31)

Saliency					1.0001 (0.57)	1.0001 (0.31)	1.0001 (0.59)
Vicinity						1.1456*** (3.65)	1.1457*** (3.64)
Option	1.4593*** (3.54)	1.4589*** (3.53)	1.4561*** (3.45)	1.4574*** (3.37)	1.4580*** (3.44)	1.3716*** (3.13)	1.3682*** (3.13)
InvSiz	1.1800*** (2.99)	1.1803*** (3.00)	1.1902*** (2.97)	1.1925*** (3.66)	1.1926*** (3.55)	1.1997 (1.59)	1.2006 (1.58)
SglStock	0.2608*** (-13.32)	0.2608*** (-13.28)	0.2580*** (-11.65)	0.2579*** (-11.36)	0.2583*** (-11.84)	0.2709*** (-12.93)	0.2702*** (-12.85)
ZeroTrd	3.1189*** (23.61)	3.1211*** (23.33)	3.1499*** (20.95)	3.1387*** (21.14)	3.1429*** (21.59)	3.1935*** (21.54)	3.1842*** (21.50)
SglStock × ZeroTrd	0.2870*** (-10.30)	0.2871*** (-9.88)	0.2879*** (-7.28)	0.2875*** (-7.43)	0.2866*** (-8.16)	0.2945*** (-10.34)	0.2946*** (-10.31)
Nokia	1.7238*** (11.22)	1.7235*** (11.33)	1.7095*** (10.55)	1.7092*** (10.90)	1.7118*** (11.21)	1.6645*** (10.72)	1.6696*** (10.78)
MktRet	0.4405*** (-5.10)	0.4405*** (-5.10)	0.4340*** (-5.23)	0.4336*** (-5.23)	0.4314*** (-5.18)	0.4300*** (-5.33)	0.4301*** (-5.32)
MktVol	0.2596** (-2.03)	0.2594** (-2.03)	0.2592** (-2.04)	0.2594** (-2.03)	0.2570** (-2.04)	0.2677** (-2.05)	0.2719** (-2.02)
Female	1.0776* (1.89)	1.0787* (1.80)	1.0948 (1.23)	1.0910 (1.33)	1.0922* (1.72)	1.1042** (2.44)	1.1062** (2.49)
Age	1.0023 (1.29)	1.0023 (1.28)	1.0023 (1.24)	1.0023 (1.28)	1.0023 (1.29)	1.0022 (1.31)	1.0023 (1.32)
Burst	0.6745*** (-5.04)	0.6747*** (-5.02)	0.6807*** (-4.89)	0.6815*** (-4.93)	0.6812*** (-4.91)	0.6744*** (-5.11)	0.6719*** (-5.12)
DurAway	0.9475*** (-20.07)	0.9475*** (-20.19)	0.9472*** (-20.16)	0.9472*** (-19.82)	0.9473*** (-19.73)	0.9486*** (-20.80)	0.9488*** (-20.67)
$\lambda$	0.6460*** (-16.07)	0.6453*** (-15.43)	0.6330*** (-13.05)	0.6340*** (-13.92)	0.6339*** (-15.73)	0.6342*** (-18.92)	0.6333*** (-19.05)
Investment size quintile dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exit time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust SE clustered at investor level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model fit	5,653.83***	5,653.72***	5,656.78***	5,662.25***	5,662.76***	5,387.32***	5391.95***
Pseudo R <sup>2</sup>	0.1762	0.1766	0.1765	0.1768	0.1783	0.1781	0.1762